Attachment 1

Notice to LEAs of Intent to Apply for Waivers under Section 9401

Notice of Intent to Apply for Waivers to U.S.D.E.

Word Version

Notice of Waiver Request
and Opportunity to Comment

September 6, 2012

TO THE ADMINISTRATOR ADDRESSED:

SUBJECT: Notice of Intent to Apply for Waivers to U. S. Department of Education and Opportunity to Submit Comments

The Texas Education Agency (TEA) is planning to submit waiver requests to the U. S. Department of Education (USDE) of certain provisions of the Elementary and Secondary Education Act (ESEA), as amended by P.L. 107-110 No Child Left Behind (NCLB) Act of 2001. The waiver requests will be submitted under the NCLB, Section 9401 waiver authority and will give TEA and the state's over 1,200 LEAs additional flexibility while reducing duplication.

The state has long emphasized college and career readiness standards, high-quality assessments, differentiated accountability, and improving teacher quality. However, the state recognizes that the lack of NCLB's reauthorization in a timely manner has created an obsolete system that does not adequately reflect the accomplishments of the state's schools. This, combined with LEAs being required to meet and function within two different assessment and accountability systems, takes valuable resources and time away from the intent and focus of improving student achievement and school accountability.

Texas has developed and begun full implementation of a statewide system that surpasses the requirements of the ESEA statute, as amended. Specifically, the state has already fully implemented the Texas College and Career Readiness Standards (CCRS) and this year is transitioning to a consolidated, differentiated accountability and interventions system that, upon approval of the waiver request, would be a single differentiated accountability system with tiered interventions beginning in school year 2013-2014. This differentiated accountability system is based on the state's rigorous new assessment system. Also, Texas continues to build upon its stringent teacher certification system that ensures every new certified teacher meets the federal highly qualified teacher requirement to ensure teacher and principal accountability for improved teaching and learning for all students.

Review and Comment

TEA is providing this notice of its intent to apply to USDE for the following waivers by posting this letter to LEAs on the TEA web site and disseminated through the TEA "To the Administrator Addressed" electronic mail list server. You may submit comments regarding this waiver application through 5pm CST, **Thursday, September 27, 201**2, via electronic mail to nclb@tea.state.tx.us.

TEA will not respond to individual comments but will use the comments and input from LEAs in finalizing the waiver requests before submission. Copies of the comments received will also be included as part of the waiver submission as required under P.L. 107-110, Section 9401(b)(3)(A).

In addition to the web posting, TEA will also provide notice and information regarding this waiver request to the general public through publishing a notice in the Texas Register in approximately two weeks.

Potential Waivers

Therefore, to further support the implementation of the state's College and Career Readiness Standards, the state accountability system, the state assessment system, the Texas accountability intervention system, and the state's teacher certification and principal accountability systems, TEA intends to request a waiver of the following statutory provisions to reduce duplication and unnecessary burden on TEA and LEAs.

- Subpart 2 – Allocations, Sections 1122, 1124, 1124A, 1125, 1125AA, 1125A, 1126, and 1127 requiring TEA to distribute Title I, Part A allocations to eligible LEAs by the statutory formula and any subsequent carryover limitations.

  Specifically, this waiver would allow TEA to allocate Title I, Part A funds to eligible LEAs based on the identified need of economically disadvantaged, educationally disadvantaged, and English Language Learner students based on state-defined eligibility, distribution formula, and carryover limitations rather than the current federal regulations.

- Section 1003(a) requiring TEA to reserve 4% of its Title I, Part A allocation for school improvement activities and to

distribute 95% to LEAs for use in Title I schools in improvement, corrective action, and restructuring.

Specifically, this waiver would allow TEA to distribute 95%, of the 4% reservation, to Title I schools identified as priority, focus, or support schools and for systemic improvement at the LEA level to support the identified schools. Current regulations prohibit the use of any Title I School Improvement Program funds at the LEA level.

- Section 1111(b)(2)(C)(E-H) defining the calculation of Adequate Yearly Progress (AYP), establishing of annual measurable objectives (performance targets) for AYP, 100% proficiency by the end of 2013-2014, and implementation of the respective requirements specified in Sections 1111 and 1116 and Section 1116(a)(1)(A-B) requiring the LEAs to make AYP determinations for schools.

  Specifically, this would allow TEA to submit a waiver of the current AYP calculations and performance targets in order to focus on one robust accountability system (the state system) that meets the intent and purposes of the ESEA statute while aligning to the state's existing systems for reform and interventions to develop new ambitious but meaningful goals to guide the support and improvement of teaching and learning. This waiver request will be submitted in January or February 2013, with the state's Accountability Workbook and when all State Assessments (STAAR) are submitted for peer review. Specifically, waivers will be requested for the following federal requirements:

  - Performance Targets/Standard Setting Procedures;
  - Use of new Texas accountability system to identify campuses and districts in place of AYP; and
  - Possibly, certain student assessment requirements (Texas has submitted our STAAR Modified Assessment for Peer Review. The remaining State Assessments will be submitted later this school year).

- Section 1116(b) requiring the LEA to identify schools for improvement, corrective action, and restructuring with corresponding requirements for implementation.

  Specifically, this waiver would allow TEA to identify schools for graduated levels of support and intervention based on the state accountability system rather than based on the current AYP regulations.

- Section 1116(b)(1)(E) and (e) and all corresponding provisions requiring the LEA to offer, in a federally prescriptive manner, school choice for schools for improvement, corrective action, and restructuring with corresponding requirements for implementation, and Section 1116(e) requiring the federally prescriptive implementation of supplemental educational services under Section 1116(b)(5, 7, and 8).

  Specifically, this waiver would allow TEA to continue implementation of the two intervention strategies, but redesign under state-developed procedures a more effective school choice and supplemental educational services program that would align to the state's accountability and interventions system.

- Section 1116(c) requiring TEA to make determinations of AYP for LEAs and identify LEAs for improvement and corrective action with corresponding requirements for implementation.

  Specifically, this waiver would allow TEA to identify LEAs based upon school performance with graduated levels of support and intervention based on the state accountability system rather than current AYP regulations.

- Section 1117 requiring TEA to establish a statewide system of support.

  Specifically, this waiver would allow TEA to implement this provision using current state systems and procedures rather than the current federal statutory language and regulations.

- Section 1119 requiring TEA and LEAs to determine highly qualified teacher (HQT) determinations and reporting, and Section 2141(a, b, and c) requiring improvement planning and intervention requirements.

  Specifically, this waiver would allow TEA to rely on the state's teacher certification standards that exceed the HQT requirements based on the state's educator evaluation system, which balances high expectations with local control rather than the current HQT regulations.

- Sections 6213(b)and 6224(e) requiring TEA to limit participation in, and use of funds under the Small, Rural School Achievement (SRSA) and Rural and Low-Income School (RLIS) programs based on whether an LEA has made AYP and is complying with the requirements in ESEA section 1116.

  Specifically, this waiver would allow an LEA that receives SRSA or RLIS funds to use those funds for any authorized purpose regardless of whether the LEA makes AYP.

- Section 1114(a)(1) requiring that a school have a poverty percentage of 40 percent or more in order to operate a

schoolwide program.

Specifically, this waiver would allow an LEA to implement interventions consistent with the state intervention principles that are based on the needs of the students in the school and designed to enhance the entire educational program in a school (operate as a schoolwide program) in any of its support, focus, or priority schools, as identified by the state system, even if those schools do not have a poverty percentage of 40 percent or more.

- Section 1117(c)(2)(A) allowing TEA to reserve Title I, Part A funds to reward a Title I school that (1) significantly closed the achievement gap between subgroups in the school; or (2) has exceeded AYP for two or more consecutive years.

  Specifically, this waiver would allow TEA to use funds reserved under this section for any schools the state determines to be reward schools.

- Section 6123 that limit the amount of funds an SEA or LEA may transfer from certain ESEA programs to other ESEA programs under the Funding Transferability provision.

  Specifically, this waiver would allow TEA and LEAs to transfer up to 100 percent of the funds it receives under the authorized programs among those programs and into Title I, Part A.

- Section 1003(g)(4) and the definition of a Tier I school in Section I.A.3 of the School Improvement Grant (SIG) final requirements.

  Specifically, this waiver would allow TEA to award TTIPS SIG funds to an LEA to implement one of the four SIG models in any of the schools that the state determines are priority schools.

- Sections 4201(b)(1)(A) and 4204(b)(2)(A) that restrict the activities provided by a community learning center under the 21st Century Community Learning Centers (21st CCLC) grant program to activities provided only during non-school hours or periods when school is not in session.

  Specifically, this waiver would allow 21st CCLC funds to be used to support expanded learning time during the school day to meet the identified needs of students in addition to activities during non-school hours or periods when school is not in session.

- Section 1113(a)(3-4) and (c)(1) requiring an LEA to serve eligible schools under Title I, Part A in rank order of poverty and to allocate Title I, Part A funds based on that rank ordering.

  Specifically, this waiver would permit LEAs to serve a Title I-eligible high school with a graduation rate below 60 percent that TEA has identified as a priority school even if that school does not otherwise rank sufficiently high to be served under section 1113.

TEA believes that these waiver requests will provide the state and LEAs with the flexibility needed to reduce duplication and unnecessary burden while allowing LEAs to focus resources on one coherent system of accountability and improvement. TEA believes these waivers will increase the academic achievement of students by improving and aligning the quality of instruction with the state's college and career readiness standards. LEAs will be better prepared to meet the robust assessment and accountability systems while being supported by the state's intervention and support system.

If you have questions regarding this waiver request, please contact Mr. Gene Lenz, Director of Federal and State Education Policy, via electronic mail at nclb@tea.state.tx.us or at (512) 463-9414.

Sincerely,

Michael L. Williams

Commissioner of Education

MW/cg

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Attachment 2

Comments on Request Received from LEAS

Attachment 2a

Committee of Practitioners Meeting Agenda

Title I Committee of Practitioners

SEDL First Floor Conference Room
4700 Mueller Blvd
Austin, Texas

AGENDA

September 18, 2012

Call to Order

- Welcome and Recognition
- Minutes of Previous Meeting

Committee Discussion Items:

- Adequate Yearly Progress
  - Update
  - Review of 2012 AYP Appeal Guidelines [Action Item: Recommendation requested.]
- McKinney-Vento Homeless Education Update
- Highly Qualified Teacher Update
- Division of School Improvement
- Grants Administration Update
- Other

Committee Action Items:

- Waiver Requests under Section 9401
- Review of Ed-Flex Individual Programmatic Waiver

Adjourn

Next Meeting

- November 27, 2012

All meetings begin at 9:00 AM. Agenda items will dictate ending times.

- Visitors are welcome to observe proceedings; however, discussion is limited to official members only.
- Ex-officio members may participate in discussion; however, voting is limited to official members only.
- Members who are absent may send a representative to participate in discussion; the representative may only vote in the member's place if the member gives a written proxy.

Attachment 2b

Comments Received from LEAs

Lenz, Gene

From: NCLB
Sent: Monday, September 10, 2012 1:06 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: TEA Waiver

Anita

From: PAMELA DETTWILER [mailto:pdettwil@springisd.org]
Sent: Thursday, September 06, 2012 2:30 PM
To: NCLB
Subject: TEA Waiver

To whom it may concern-

I am in total agreement with the state in seeking a waiver. I believe this outdated system of accountability needs to be changed. Holding Texas schools to the AYP standards with a new state assessment is unfair. We lose the good faith of our community when we are required to send a letter stating that we did not make AYP even though the state assessment standards have not yet been established. This makes no sense.

--

"Use what talents you possess; the woods would be very silent if no birds sang there except those that sang best. "

Henry Van Dyke

Pamela Dettwiler, Principal
McNabb Elementary School
pdettwil@springisd.org
281-891-8692

Lenz, Gene

From: NCLB
Sent: Monday, September 10, 2012 1:05 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Extremely low state average scores compromise meaningfulness of results

Anita

From: Christy Phillips [mailto:christy.phillips@wpisd.com]
Sent: Friday, September 07, 2012 10:41 AM
To: commisioner@tea.state.tx.us; NCLB
Subject: Fwd: Extremely low state average scores compromise meaningfulness of results

I believe this should have been sent to you initially, and you were inadvertently left off.
---------- Forwarded message ----------
From: **Christy Phillips** <christy.phillips@wpisd.com>
Date: Mon, Aug 27, 2012 at 2:18 PM
Subject: Extremely low state average scores compromise meaningfulness of results
To: sboesupport@tea.state.tx.us, research@tea.state.tx.us, commisioner@tea.state.tx.us, GeneralInquiry@tea.state.tx.us, curriculum@tea.state.tx.us, teainfo@tea.state.tx.us, escsupport@tea.state.tx.us, eip@tea.state.tx.us, sped@tea.state.tx.us, nclb@tea.state.tx.us, performance.reporting@tea.state.tx.us, pmidivision@tea.state.tx.us, pir@tea.state.tx.us
Cc: thomas@thomasratliff.com, gmcjhs@aol.com, Charlie@charliegarza.com

Texas is spending more time and money on state testing than most any state in the nation. So what are we getting in return? While I have for many years been in favor of state testing as a means of improving education for children, I believe that the current testing system is not providing adequate and valid usefulness to drive educational decisions nor evaluate students, schools, or our state education system. The reason for this I believe is mainly that, in our quest to increase rigor, we have created tests that have state averages, and sometimes passing levels, at around 50%. After watching this trend, I find it difficult to reconcile my general mathematical/statistical knowledge and basic common sense with the current prevailing view that our state testing system is extremely valuable in promoting better educational outcomes in Texas. As a secondary science teacher, I was taught that my students' classroom test scores should average at least 75% in order to confirm that I had adequately taught the material. If the average score was too high, then I did not make the test rigorous enough to make distinctions between those students who learned the most and those who learned the least. Likewise, if the average score was too low, then I could not make appropriate distinctions between these groups either. Low averages also reflected poor mastery of what I had expected students to learn, while high averages reflected that I probably didn't have high enough expectations. So the most useful test results were those which were well-designed and produced averages along a fairly bell-shaped distribution curve in the 75-85 range. There should be few As and few Fs. While it appears that Pearson does an adequate job on test design and matching the testing material to our curriculum, there remains a problem. Might it be that our curriculum is possibly moving faster than the average students can learn? We are congratulating ourself on increasing rigor, but at the expense of mastery. This might be why students seem to know a little about a lot, while sacrificing true mastery of the huge majority of the material. Granted, we can't go back to just teaching a few basics, but we need to have some balance between rigor and mastery, as the current trend is weighted heavily in favor of rigor, even though we claim that students have demonstrated mastery on a multiple-choice test with only 52% mastery on the curriculum-based measure. Furthermore, the average percentag scores on the STAAR Math test for special education students have been averaging near 30%, therefore making their their test data rather meaningless, since students could obtain a score of approximately 25% if they merely guessed at each question. Will TEA provide our schools and the

public with appropriate interpretation guidance about these results, or will they allow the current pattern of misinterpretation of results to continue to flourish because it is politically easier to do so? I, as well as many of my colleagues, would hope that you do not choose the latter cowardly option, as our children and our state deserve better.

Christy Phillips, Educational Diagnostician (and concerned tax payer)

Lenz, Gene

From: NCLB
Sent: Monday, September 10, 2012 1:05 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Waiver Comment

Anita

From: David Velky [mailto:david.velky@rockspringsisd.net]
Sent: Friday, September 07, 2012 11:08 AM
To: NCLB
Cc: Laura Strube (laura.strube@netxv.net); JOYCE SPROTT (joyce.sprott@netxv.net); robin.harmon@netxv.net
Subject: Waiver Comment

Dear Mr. Williams:

I strongly support your application for a waiver from the requirements of No child Left Behind. The burdensome requirements of AYP are an example of unnecessary federal duplication of state accountability processes.

In Texas, we have a thorough and effective accountability system that is rigorous and curriculum-based. In addition, our state system has had a 30-plus-year tradition of *incremental* increases in standards. This gradual approach to raising standards has, in general, served our state and local education agencies well as we seek to improve student achievement and college readiness.

The AYP system, however, is now increasing accountability requirements at a rate that is unwise. In one year, we have gone from having few campuses miss AYP to having a large majority of districts facing AYP issues. This seems to be an indication that the federal system is out-of-touch with our local and state issues.

Thank you for supporting a waiver from selected provisions of the No Child Left Behind Act.

David Velky, Superintendent
Rocksprings Independent School District

"Rocksprings ISD envisions our students becoming productive, successful, self-reliant, life-long learners."---Mission Statement, RISD

Lenz, Gene

From: NCLB
Sent: Monday, September 10, 2012 1:04 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: wavier request

Anita

From: Grubbs, Betty [mailto:betty.grubbs@birdvilleschools.net]
Sent: Friday, September 07, 2012 11:09 AM
To: NCLB
Subject: wavier request

As a Title I administrator, I strongly support the waiver request for Texas. Our district serves over 15 Title I campuses and receives over $4,000,000 in Title I funds. Most of our Title I campuses are either Recognized or Exemplary under the current rating system. That being said, three of our campuses entered Title I school improvement this year—even though their scores would have been sufficient for each campus to be rated Recognized.

The requirement to pull Title I funds to pay for transportation has ultimately resulted in our students receiving less services. The purpose of Title I is to provide a quality instruction for students living in poverty. Transporting student to another campus does not ultimately lead to improvement, yet we are required to hold back up to 20% of our entitlement for this purpose.

The NCLB requirements have become untenable and are a detriment to the intent and purposes of Title I.

I strongly support the waiver request.

Betty Grubbs, PhD
Director of Special Services
Birdville ISD
817-547-5740

Statement of Confidentiality

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Lenz, Gene

From: NCLB
Sent: Monday, September 10, 2012 1:04 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Please Keep funding after school and Summer Programs

Anita

From: Quick Draw Photo Booth [mailto:info@quickdrawphotobooth.com]
Sent: Friday, September 07, 2012 2:52 PM
To: NCLB
Subject: Please Keep funding after school and Summer Programs

Hello,
My name is Aron Taylor. For four years I have been teaching after school programming as a teaching artist with Creative Action (formerly called Theatre Action Project). I would like to share the great success that my students have accomplished as a result of the programming offered with funding to 21st CCLC.
My job with Creative Action is to acivate the emotional, academic, and social development of young people. I have taken many steps to ensure the success of my job. For one, I have always sought out the email contacts of my students' daytime teachers, so that we can be in communication about the expectations and development of thier students. Each of my lessons provide my students opportunities to be critical thinkers, creative artists, courageous allies, and confident leaders. We do all of this using art! Plenty of art. This keeps the kids well engaged in what they are doing. We really capture their imagination and make learning fun.
While our programming does promote higher scores on standardized testing, we are not spending our time reviewing and cramming for such exams, thus allowing the atmosphere of our classes to be a bit more loose - and focused more upon the importance of personal responsibility and choice.
I appreciate TEA's support of after school and summer learning through funding, training, and technical assistance for ACE 21st CCLC and I would very much like to see this support continue on for many years to come.

Thank you for your time,

Aron Taylor
Visual/Performance Artist
Quick Draw Photo Booth
512.731.7124

Like us on Facebook!
Facebook

Find us on Yelp!

Lenz, Gene

From: NCLB
Sent: Monday, September 10, 2012 1:04 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: 21st Century Community Learning Centers

Anita

From: Rita De Young [mailto:rdeyoung@campfirelonestar.org]
Sent: Friday, September 07, 2012 7:02 PM
To: NCLB
Cc: Hoff, Susan; Tanya McDonald; Janet Mockovciak
Subject: 21st Century Community Learning Centers

NCLB Administrators:

I appreciate TEA's support of afterschool and summer learning through funding, training, and technical assistance for Texas Afterschool Centers on Education (ACE) 21st Century Community Learning Centers (21st CCLC).

- **Texas ACE 21st CCLC has created a rich system of high-quality learning afterschool and summer experiences that support and complement what is offered during the school day.**

- **Research conducted by Dr. Deborah Vandell at the University of California Irvine and others shows that afterschool and summer programs reduce summer learning loss and improve school attendance and engagement. Studies of programs in Texas document increases in standardized test scores and grade promotion.**

- **Afterschool programs can provide a different kind of learning that is engaging and experiential and helps students, including those for whom traditional classroom learning is ineffective.**

Eliminating afterschool programs will immediately put hundreds of people in DISD programs out of work. We encourage TEA to seek funding in other ways that won't further damage disadvantaged children who need help the most.

Sincerely,
RITA DE YOUNG
Chief Executive Officer

Camp Fire Lone Star
Direct [214] 824 1122
Fax [214] 824 1148
Find us on Facebook: facebook.com/campfirelonestar
Find us on the Web: www.campfireusadallas.org

Light the fire within

Lenz, Gene

From: NCLB
Sent: Tuesday, September 11, 2012 7:38 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Message from a Web Site Viewer - AYP

Anita

From: Performance Reporting
Sent: Monday, September 10, 2012 4:18 PM
To: NCLB
Subject: Re: Message from a Web Site Viewer - AYP

For your response, please.

Thank you
Performance Reporting

From: Rick Teran [mailto:RTeran@childressisd.net]
Sent: Friday, September 07, 2012 11:05 AM
To: Performance Reporting
Subject: Message from a Web Site Viewer - AYP

The state is applying for a waiver of portions of the AYP process. However it is not clear as to what the waiver means to a local district. I have had some conversations with fellow superintendents since this news has come out. They asked me if I would contact your office and try to get a better understanding of what the waiver means to a individual district.

Thank you for your help.

Rick Teran
Superintendent
Childress ISD

Joshua 24:15
"As for me and my house we will serve the Lord"

Lenz, Gene

From: NCLB
Sent: Monday, September 10, 2012 1:03 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: waivers

Anita

From: Bender, Karen [mailto:benderk@chapelhillisd.org]
Sent: Monday, September 10, 2012 8:15 AM
To: NCLB
Subject: waivers

Mr. Lenz,

I just wanted to thank you for your interest in getting the Federal system "fixed" so it benefits all the students of Texas. I have been in the classroom for 20 years (and now as an administrator) and I have seen many things come and go. We need a strong voice in Texas who understands the hardships our teachers and students face due to the implementation of some phases of NCLB. Thank you for your efforts on our behalf.

Karen Bender

Karen Bender
Assistant Principal
Chapel Hill High School
13172 Hwy. 64 East
Tyler, Tx. 75707
903-566-2311 ext. 1415

Lenz, Gene

From: NCLB
Sent: Monday, September 10, 2012 1:03 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: input on No Child Left Behind Waivers

Anita

From: Natalie Goodnow [mailto:nataliemgoodnow@gmail.com]
Sent: Monday, September 10, 2012 9:07 AM
To: NCLB
Subject: input on No Child Left Behind Waivers

To whom it may concern:

I appreciate TEA's support of afterschool and summer learning through funding, training, and technical assistance for Texas Afterschool Centers on Education (ACE) 21st Century Community Learning Centers (21st CCLC). Texas ACE 21st CCLC has created a rich system of high-quality learning afterschool and summer experiences that support and complement what is offered during the school day. Research conducted by Dr. Deborah Vandell at the University of California Irvine and others shows that afterschool and summer programs reduce summer learning loss and improve school attendance and engagement. Studies of programs in Texas document increases in standardized test scores and grade promotion. What's more, afterschool programs can provide a different kind of learning that is engaging and experiential and helps students, including those for whom traditional classroom learning is ineffective.

As a an afterschool teacher and as an administrator who has worked to mentor and train other afterschool teachers, I have seen countless examples of the positive impact that afterschool programs have in central Texas. One of my favorites was a student at Creedmoor Elementary who, at a ceremony at the end of the school year, thanked the afterschool program coordinator for all her work because "ACE Afterschool was the most fun thing I ever did in my life!" And I know it wasn't just fun; I saw those students learn an awful lot about their community, themselves, healthy living, respecting the environment, and they also received help with homework and in developing study skills, too. Please help us keep afterschool programs thriving.

Natalie Goodnow

Lenz, Gene

From: NCLB
Sent: Tuesday, September 11, 2012 7:37 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Waiver

Anita

From: GAIL MACARI [mailto:gailm@springisd.org]
Sent: Monday, September 10, 2012 7:17 PM
To: NCLB
Subject: Waiver

I am strongly in support of waiver.

Lenz, Gene

From: NCLB
Sent: Tuesday, September 11, 2012 7:35 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: NCLB Waiver Questions

Anita

From: Michelle Bonton [mailto:mlbonton@yahoo.com]
Sent: Monday, September 10, 2012 9:47 PM
To: NCLB
Subject: NCLB Waiver Questions

How will the HQT waiver affect charter school relative to HQT. Federal law only requires teachers to have a bachelor's degree. The state only requires charter school teachers to have a high school diploma. How will the waiver impact this? Will charter school teachers go back to only needing a bachelor's degree. Will there be another way for charter school teachers to demonstrate competency outside of the certification exams?

Additionally, will the AYP portion of the waiver impact AYP ratings received as a result of 2011-12 state mandated assessments? If so, how?

TKS!

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:19 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: USDA Waiver

Anita

-----Original Message-----
From: Stephanie Schilling [mailto:stephanie.schilling@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 12:02 PM
To: NCLB
Subject: USDA Waiver

I support the Texas Education Agency's submission of the NCLB waiver.
The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable - 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.
If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Thank you,
Stephanie Schilling

--
Stephanie Schilling
Hillcrest Elementary Principal
514 Pear Ave.
Dumas, Tx 79029
806-935-5629 school
806-934-1439 fax

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:20 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Waiver Comment
Attachments: Waiver Comment.docx; carla_tafoya.vcf

Anita

-----Original Message-----
From: Carla Tafoya [mailto:carla.tafoya@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 10:21 AM
To: NCLB
Subject: Waiver Comment

Please consider the attached comment on the NCLB waiver.
Thank you,
Carla L. Tafoya

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:21 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment regarding USDE Waiver

Anita

From: Stan Stroebel [mailto:stan.stroebel@dumas-k12.net]
Sent: Thursday, September 13, 2012 10:03 AM
To: NCLB
Subject: Comment regarding USDE Waiver

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Stan Stroebel, Principal
Morningside Elementary
(806) 935-4153

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:21 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Support of AYP Waiver
Attachments: Waiver Comment-1.docx

Anita

-----Original Message-----
From: Mark Stroebel [mailto:mark.stroebel@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 10:00 AM
To: NCLB
Subject: Support of AYP Waiver

Please find enclosed my support of the AYP Waiver.

To whom it may concern,

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Sincerely,
Mark Stroebel
Superintendent
Dumas ISD

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:21 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment regarding USDE Waiver

Anita

From: Majhaunta Edgmon [mailto:majhaunta.edgmon@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 9:58 AM
To: NCLB
Subject: Comment regarding USDE Waiver

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Majhaunta Edgmon
Dumas ISD
Special Services Director

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:22 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: "Comment regarding USDE Waiver"

Anita

-----Original Message-----
From: Andrea Cox [mailto:andrea.cox@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 9:33 AM
To: NCLB
Subject: "Comment regarding USDE Waiver"

I support the Texas Education Agency's submission of the NCLB waiver.
The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable - 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:22 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment regarding USDE waiver

Anita

-----Original Message-----
From: terri.davis [mailto:terri.davis@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 9:31 AM
To: NCLB
Subject: Comment regarding USDE waiver

I support the Texas Education Agency's submission of the NCLB waiver.
The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable - 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:23 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment regarding NCLB Waiver

Anita

From: Kelly Legg [mailto:kelly.legg@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 9:20 AM
To: NCLB
Subject: Comment regarding NCLB Waiver

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Thank you,
Kelly Legg
Assistant Superintendent for Instruction
Dumas ISD

--
Kelly Legg
Assistant Superintendent for Instruction
Dumas ISD
806-935-6461

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:27 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: USDE Texas Waiver

Anita

From: Pamela Zoda [mailto:pamelazoda@gmail.com]
Sent: Wednesday, September 12, 2012 3:00 PM
To: NCLB
Subject: USDE Texas Waiver

Dear Hard Working State Official,

I am writing in support of the USDE Waiver for Texas regarding the current dualing and opposed accountability systems in place. While the intent of both the Federal and State standards are to focus schools and hold everyone involved accountable, the intent is lost in the message. It is difficult to explain how your child's campus/district can be exemplary or recongized and at the same time the same campus/district missed adequately yearly progress. Our district is one of the largest in the state. We are growing by about 1,500 students each year for the past 7 years. We were one of the largest school district in the state of Texas to earn Recognized for 2011 (Exemplary in 2010) but in 2012 our district missed AYP in 2 indicators while AEIS ratings were unavailable.

AYP seems to penalize districts that are large and diverse because larger school districts will certainly have enough students to make a group. I can guarantee you that our district has moved mountains this past school year (and will continue to do so no matter what accountability system is in place). While we will continue to work on our identified areas of need, I believe Texas needs to join the team! We need one accountability system that communicates a clear and consistent message to schools, school leaders, school boards, and the community. Our targets must be realistic and high while using some sense of logic. I am sure a 100% passing standard sounded good in a sound bite but we are talking about public school. We are educating all kids to the highest of their potential (not just the governor's son whom I am sure is in private school)--all kids, in all academic areas with the goal of creating college ready and productive citizens. Help us save Texas by creating a system that is well thought out, targeted, and makes sense.

Regards,

Pam Zoda
Parent, Public School Administrator (17 years in education), Tax Payer

Lenz, Gene

From: NCLB
Sent: Thursday, September 13, 2012 2:28 PM
To: Lenz, Gene; Green, Cory
Subject: FW: Comment regarding USDE Waiver
Attachments: sharla_wilson.vcf

Anita

From: Sharla Wilson [mailto:sharla.wilson@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 2:27 PM
To: NCLB
Subject: Comment regarding USDE Waiver

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers, and students, especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress, and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Thank you,
Sharla Wilson

Lenz, Gene

From: NCLB
Sent: Wednesday, September 19, 2012 7:51 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment regarding USDE Waiver

Anita

-----Original Message-----
From: Sally Heaton [mailto:sally.heaton@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 2:59 PM
To: NCLB
Subject: Comment regarding USDE Waiver

TEA Personnel:

I support TEA's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers, and students, especially given the unattainable 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state standards and assessment. The state system is better equipped to measure the growth, progress, and college readiness of our Texas students. The new state accountability system, currently being developed, will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Thank you,
Sally Heaton

--
Sally Heaton
Secondary Curriculum Director
Testing Coordinator
Dumas ISD
sally.heaton@dumas-k12.net
806.935.6461

Lenz, Gene

From: NCLB
Sent: Wednesday, September 19, 2012 7:51 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment regarding USDE Waiver
Attachments: Waiver Comment

Anita

-----Original Message-----
From: Frances Whitson [mailto:frances.whitson@mail.dumas-k12.net]
Sent: Thursday, September 13, 2012 6:58 PM
To: NCLB
Subject: Comment regarding USDE Waiver

--
Frances Whitson
Elementary Curriculum Director
Dumas ISD
Dumas, TX 79029

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Lenz, Gene

From: NCLB
Sent: Wednesday, September 19, 2012 7:43 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: comment regarding USDE waiver
Attachments: kellysullivan_carrell.vcf

Anita

-----Original Message-----
From: Kelly D. Carrell [mailto:kellysullivan.carrell@mail.dumas-k12.net]
Sent: Friday, September 14, 2012 10:42 AM
To: NCLB
Subject: comment regarding USDE waiver

I support the Texas Education Agency's submission of the NCLB waiver.
The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable - 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.
If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Lenz, Gene

From: NCLB
Sent: Wednesday, September 19, 2012 7:42 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment Regarding USDE Waiver
Attachments: philip_rhodes.vcf

Anita

-----Original Message-----
From: Philip Rhodes [mailto:philip.rhodes@mail.dumas-k12.net]
Sent: Friday, September 14, 2012 11:05 AM
To: NCLB
Subject: Comment Regarding USDE Waiver

As a middle school principal, I am in complete support of the Texas Education Agency's recent decision to submit a waiver for NCLB. Our state accountability system is stringent enough without the extra burden of a completely unattainable federal accountability system also. It is my hope that as our state system of accountability continues to be developed it will continue to measure individual student growth as well as college readiness. The new state system will hopefully provide districts and campuses a more diagnostic analysis of student progress and not such a school wide punitive system like the one currently in place under NCLB.

If Texas educators were allowed to focus on one system of accountability that takes into account individual student improvement, language acquisition, special needs learners, and college readiness, I believe we could have a beneficial diagnostic tool. I am completely in favor of an accountability system in Texas; however, the one currently in place under No Child Left Behind is extraordinarily flawed and only serves to punish schools for not meeting unrealistic goals. This punitive approach only adds undue anxiety for the entire school community. I appreciate the Texas Education Agency taking a stand and applying for a waiver for No Child Left Behind.

Sincerely,
Philip Rhodes
Dumas Intermediate School
Dumas, TX 79029

Lenz, Gene

From: NCLB
Sent: Wednesday, September 19, 2012 7:41 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment regarding USDE Waiver

Anita

From: Cody Strickland [mailto:cody.strickland@mail.dumas-k12.net]
Sent: Friday, September 14, 2012 3:03 PM
To: NCLB
Subject: Comment regarding USDE Waiver

To Whom it May Concern:

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers, and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress, and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will, in turn, increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Cody Strickland
Assistant Principal
Dumas Intermediate School

Lenz, Gene

From: NCLB
Sent: Wednesday, September 19, 2012 7:38 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Waiver Comments

Anita

-----Original Message-----
From: Deann Lee [mailto:dlee@ParisISD.net]
Sent: Monday, September 17, 2012 9:20 AM
To: NCLB
Cc: Deann Lee
Subject: Waiver Comments

I commend Governor Perry, Commissioner Williams, and TEA for realizing the detrimental effects of the present NCLB/ESEA law on the students of Texas and submitting these waivers.

The summary available in the To the Administrator Addressed letter is excellent. However, the points could be interpreted various ways. Therefore, my comments are based soley on the information available in the TAA and my undertstanding could be incorrect.

Bullet 1- I believe this is addressing the fact that the present formula favors large, urban districts due to sheer numbers rather than on eligibility and need. I applaud the recognition of this and the desire to provide a more equitable formula.

2- This year's change to more systemic improvement instead of campus-based only was extremely intuitive. Funds to support those efforts are needed, so this change would be welcomed.

3- My understanding is that the waiver wouldn't be submitted until after the new state accountability system is approved by the Commissioner. Is that correct? Otherwise, my concern would be whether USDE would approve a waiver based on an accountability system still under development. I am on the APAC and realize the great efforts being taken to marry state and federal accountability as much as possible and appreciate all the efforts to do so.

4- Excellent

5- Without seeing the details of this point, the concern is that some might use this opportunity to expand school choice to private entities. If that is the intent of the waiver for Section 1116(b)(1)(E) and (e), I cannot support it. With historic funding cuts to education, we cannot agree to what would be further cuts. As for SES, it cannot be worse. The money is given to private entities many of which do not have the students' best interests at heart. This year's efforts toward improvement, though, have been tremendous. The bottom line is that SES is unnecessary and the funds required for it could be utilized in much more effective ways.

6- good

7- Right now the SIRC (changed to TCDSS this year)/ TEA division is very confusing. I believe this waiver would allow TEA to take care of requirements without having to have the separate entity. The funds now diverted to TCDSS would be needed in order for TEA to handle the additional responsibilities.

8- As one who deals with HQ on a daily basis, thank you.

9- great

10- This would be WONDERFUL. The coordination of funding this would allow would help students in tremendous ways. The only catch is that it could possibly stretch funds even further.

11- fine

12- fine

13- Great. Definition of Tier 1 is limiting at present

14- Wonderful! But it was my understanding that this grant was no longer funded except for those in current cycles. ? I likely have this confused with another grant.

15- good

Thank you for your time,
Deann Lee
State/Federal Programs
Paris Independent School District
903-737-7500, ext. 2824

Lenz, Gene

From: NCLB
Sent: Wednesday, September 19, 2012 7:35 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comment regarding USDE Waiver (attached)
Attachments: USDE Waiver.doc; james_bussard.vcf

Anita

-----Original Message-----
From: James Bussard [mailto:james.bussard@mail.dumas-k12.net]
Sent: Tuesday, September 18, 2012 9:52 AM
To: NCLB
Subject: Comment regarding USDE Waiver (attached)

see attachment

Dumas Junior High School

P. O. Box 697
Dumas, Texas 79029
(806) 935-4155

James Bussard
Assistant Principal

September 18, 2012

To Whom It May Concern:

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

Sincerely,

James Bussard
Assistant Principal

Lenz, Gene

From: NCLB
Sent: Wednesday, September 19, 2012 3:38 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: "Comment regarding USDE Waiver"

Anita

From: Kurt Baxter [mailto:kurt.baxter@mail.dumas-k12.net]
Sent: Wednesday, September 19, 2012 1:34 PM
To: NCLB
Subject: "Comment regarding USDE Waiver"

I support the Texas Education Agency's submission of the NCLB waiver. The burden of operating under two different accountability systems has put undue stress on schools, teachers and students especially given the unattainable – 100% standard that is approaching with NCLB. The state has operated an accountability system for many years that has progressed and evolved along with our state testing. The state system is better equipped to measure the growth, progress and college readiness of our Texas students. The new state accountability system currently being developed will give campuses and districts a clearer picture of where their students are in their learning and the progress/growth the students are attaining.

If Texas educators are able to focus on one target, districts and campuses will begin to see more focused intervention and planning. This will in turn increase the academic performance of our students and decrease the level of anxiety and discontent we are beginning to see in our teachers. We need accountability in our education system, but we need only one system and we need that system to be realistic.

--
Kurt Baxter
Principal
Dumas Junior High School
806.935.4155
YOU...Make It Matter!!

Lenz, Gene

From: NCLB
Sent: Friday, September 21, 2012 3:38 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: waiver

Anita

From: Sandy Villarreal [mailto:villarreals@rungeisd.org]
Sent: Friday, September 21, 2012 2:21 PM
To: NCLB
Subject: waiver

TEA,
As an educator for the past 31 years, I have seen numerous tests come and go, however, this is the first time that I have seen a new test have such an impact on schools across the state of Texas. I do believe that we are all accountable for the students in our school districts and that we do ALL that we can to make them productive future citizens. However, I feel that the fact that the state and the federal government are not on the "same page" is a giant obstacle to success. The proposed waiver would give the state of Texas the authority to determine the success and failure of schools rather than the federal government, which is how it should be. Who knows better about the school's performance than their own state education agency. To me, it's like a "slap in the face" when the federal government comes along and says, "OK, Texas, you changed the test to the STAAR, and you are going to give the schools a year to adjust in the areas they need to before labeling the district, but, we (federal govt) aren't going to change anything we do!" Seems like TEA is not the ones really in charge any longer!
I would hope that the majority of educators feel as I do and that the waiver request will be approved.

Sandy Villarreal
Runge Elementary Principal

*** This Email was sent by a staff member in Runge Independent School District.

Lenz, Gene

From: NCLB
Sent: Tuesday, September 25, 2012 8:59 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: TEA NCLB Waiver

Anita

-----Original Message-----
From: Jennifer Pinkerton [mailto:jpinkerton@pi-isd.net]
Sent: Monday, September 24, 2012 9:47 AM
To: NCLB
Subject: TEA NCLB Waiver

Point Isabel ISD supports the waiver TEA is requesting from USDE regarding NCLB with the following exceptions:

- Title I funds should continue to be allocated directly to local school districts based on need of economically disadvantaged students
- TEA should not control Title I funds and allocate based on student performance or any other method outside the Weighted Average Daily Attendance (WADA) formulas

Jennifer Pinkerton
Point Isabel ISD
Board President
Jpinkerton@pi-isd.net
sent from my iPhone

Lenz, Gene

From: NCLB
Sent: Tuesday, September 25, 2012 8:59 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Waiver

Anita

From: Karen Harper [mailto:kharper@pi-isd.net]
Sent: Monday, September 24, 2012 9:49 AM
To: NCLB
Subject: Waiver

Point Isabel ISD supports the waiver TEA is requesting from USDE regarding NCLB with the following exceptions:

- Title I funds should continue to be allocated directly to local school districts based on need of economically disadvantaged students
- TEA should not control Title I funds and allocate based on student performance or any other method outside the Weighted Average Daily Attendance (WADA) formulas

Karen Camp Harper
Principal
Garriga Elementary

"Beginning with the End in Mind"

Lenz, Gene

From: NCLB
Sent: Tuesday, September 25, 2012 8:58 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: TEA Waiver

Anita

From: Nancy Gonzalez [mailto:ngonzalez@pi-isd.net]
Sent: Monday, September 24, 2012 10:08 AM
To: NCLB
Subject: TEA Waiver

Point Isabel ISD supports the waiver TEA is requesting from USDE regarding NCLB with the following exceptions:

- Title I funds should continue to be allocated directly to local school districts based on need of economically disadvantaged students
- TEA should not control Title I funds and allocate based on student performance or any other method outside the Weighted Average Daily Attendance (WADA) formulas

Nancy S. Gonzalez
Port Isabel Junior High Principal
Point Isabel I.S.D.

TARPONS
(956) 943-0060 office
(956) 943-0055 fax

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Lenz, Gene

From: NCLB
Sent: Tuesday, September 25, 2012 8:57 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: comment on TX Waiver

Anita

From: Lyndaplmr@aol.com [mailto:Lyndaplmr@aol.com]
Sent: Monday, September 24, 2012 2:33 PM
To: NCLB
Subject: comment on TX Waiver

This email is to comment on the Waiver to USDE applied for by Texas Education Agency. I object to the proposal to waive Sec 1119 requiring LEAs to determine highly qualified teacher determination and reporting, and Section 2141 (a,b, and c) requiring improvement planning and intervention requirements.

It appears that TEA intends to use teacher certification rather than the federal standards for determining highly qualified status. The federal system is much preferred by charter schools because it means we can hire qualified individuals who are not certified, but instead show competency by taking the certification tests or through HOUSE. Allowing this waiver to the federal rules will impose a hardship on charter schools by restricting the hiring of qualified individuals. It will impede the entry of qualified individuals into the teaching field by requiring they earn certification, rather than just take the required certification test to prove competency.

Thank you.

Lynda Plummer, Administrator
Bright Ideas Charter School
2507 Central Freeway E.
Wichita Falls, TX 76302
940.767.1561 X13

This e-mail message (and attachments) may contain confidential Bright Ideas School and Bright Ideas Charter School information. If you are not the intended recipient, you cannot use, distribute, or copy the message or attachments. In such a case, please notify the sender by return e-mail immediately and erase all copies of the message and attachments. The opinions, conclusions, and other information in this message and attachments that do not relate to official business are neither given nor endorsed by BIS and BICS.

Lenz, Gene

From: NCLB
Sent: Tuesday, September 25, 2012 8:47 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Waiver Application to USDE

Anita

From: Sewell, Catherine [mailto:csewell@eisd.org]
Sent: Tuesday, September 25, 2012 8:17 AM
To: NCLB
Cc: Pfeifer, Jerilyn
Subject: Waiver Application to USDE

To Whom it May Concern:

I am in full support of the commissioner's intent to apply for waivers on the provisions listed in the publication dated September 6, 2012.

Of particular note, Section 1111 has distinct merit for waiving federal requirements for AYP accountability in order to make one state accountability system that is robust in meeting federal requirements aligned with stringent state requirements.

All waivers described are appropriate and I pledge my support for this endeavor.

Sincerely, Cathy Sewell

Cathy Sewell, M.Ed.
Assistant Superintendent
Curriculum and Instruction
Everman ISD, 608 Townley Drive
Everman, TX 76140
817-568-3500 (w)
817-568-3508 (fax)

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Lenz, Gene

From: NCLB
Sent: Wednesday, September 26, 2012 8:03 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: waiver
Attachments: New Rabbit Black.jpg

Anita

-----Original Message-----
From: Chris Wade (Ralls ISD) [mailto:chriswade@esc17.net]
Sent: Wednesday, September 26, 2012 7:58 AM
To: NCLB
Subject: waiver

I ask that you please complete the waiver process. Basing a rating on the proposed levels is by no means fair. Even our brightest students will struggle to meet the criteria.

Chris Wade
Superintendent

Ralls Independent School District
806-253-2509 O
806-253-2508 F

810 Ave I
Ralls, Texas 79357

[cid:232A0649-4A2E-4B20-A148-33009D232102@dist.ralls.k12.tx.us]

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Lenz, Gene

From: NCLB
Sent: Wednesday, September 26, 2012 2:37 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: USDE Waiver Comment

Anita

From: Brokovich, Jeffrey [mailto:jeffrey.brokovich@abileneisd.org]
Sent: Wednesday, September 26, 2012 2:33 PM
To: NCLB
Subject: USDE Waiver Comment

To Whom it May Concern,

According to TEA, this waiver would "allow TEA to allocate Title I, Part A funds to eligible LEAs based on the identified need of economically disadvantaged, educationally disadvantaged, and English Language Learner students based on state-defined eligibility, distribution formula, and carryover limitations rather than the current federal regulations." This idea is concerning to us as our Federal Funding has already been reduced by nearly $850,000 over the last two years in spite of the fact that our Economically Disadvantaged and English Language Learner numbers have been increasing. With the state funding cuts and TEA's staffing cuts, one can't help but question the capacity and ability for TEA to fairly determine funding amounts to districts. Already, the state funding systems are allegedly inadequate and inequitable as indicated by several pending lawsuits. Systems need to be in place to ensure that the maximum amount of Title 1 funding streams to the districts in a fair and equitable manner.

Respectfully,

Jeffrey M. Brokovich, M.Ed.
Executive Director of Federal Programs
One AISD Center / Office of Federal Programs
P.O. Box 981
Abilene Texas, 79604-0981
(325) 677-1444, ext. 7407
(325) 794-1326 fax
Email: jeffrey.brokovich@abileneisd.org

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Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 9:42 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Citizen Schools: recommendations for Texas ESEA waiver application
Attachments: Citizen Schoools_ESEA waivers memo.pdf

Anita

From: Callie Kozlak [mailto:calliekozlak@citizenschools.org]
Sent: Wednesday, September 26, 2012 3:07 PM
To: NCLB
Subject: Citizen Schools: recommendations for Texas ESEA waiver application

To Whom It May Concern:

Enclosed please find Citizen Schools public comments and recommendations for the State of Texas ESEA waiver application to the US Department of Education. Citizen Schools is an education non-profit that partners with low-performing public middle schools to expand the learning day. Citizen Schools has a regional office in Houston, Texas.

Thank you,
Callie Kozlak

--
Callie Kozlak | Deputy Director of Growth & Policy | Citizen Schools
(202) 550-8285 (cell) | (617) 695-2300, ext. 1526
Partnering to Expand the Learning Day

CITIZEN SCHOOLS

MEMORANDUM

Recommendations for State ESEA Flexibility: Leveraging Title I, Part A Funding and Title IV, Part D, 21st Century Community Learning Centers, Funding to Improve Student Outcomes in High Need Schools

Introduction

The US Department of Education's Elementary and Secondary Education Act (ESEA) flexibility package provides states and districts with a unique opportunity to repurpose federal funding to support innovative partnerships with nonprofit and community-based organizations with a demonstrated record of promoting student achievement. These organizations are poised to:

1) provide the additional capacity needed to implement the reforms required by the *State-Developed Differentiated Recognition, Accountability and Support* section of the ESEA flexibility package (Principle 2); and
2) support districts' and schools' efforts to implement the turnaround principles outlined in ESEA flexibility package.

Redeploying Supplemental Educational Services (SES) dollars along with 21st Century Community Learning Center (21st CCLC) funds and School Improvement Grants (SIG) funds will not only support states, districts, and schools in meeting the ESEA flexibility requirements, but will also ensure that the highest-need schools are able to partner with proven nonprofit and community-based organizations to deliver the evidence-based supports required to ensure that students graduate college-and career-ready.

The paragraphs that follow describe how repurposing funds previously set aside for SES, 21st CCLC, and SIG to support school partnerships with nonprofit and community-based organizations will help state education agencies (SEAs), local education agencies (LEAs), and schools to implement the reforms required by the ESEA flexibility package to increase the quality of instruction for students and improve student achievement.

ESEA flexibility can be leveraged to add necessary capacity to schools and districts.

Currently, nonprofit and community-based organizations throughout the country are utilizing evidence-based practices to partner with schools and districts to improve student outcomes. These organizations are delivering vital educational supports, such as, targeted and school-wide research-based interventions in literacy, math, attendance and behavior shown to increase student achievement and are providing thousands of hours of additional learning time to millions of students.[1] However, these high-quality organizations are only able to reach a fraction of the students whose lives would be transformed by the targeted attention and support nonprofit and community-based partners are able to provide. In high-needs schools, the majority of students from low-income families often require intensive support that schools do not have the capacity to provide, creating a gap between the attention students require and the services schools can provide.[2]

[1] Balfanz, R., Bridgeland, J.M., Fox, J.H. & Moore, L.A. (2010).Building a Grad Nation: Progress and Challenge in Ending the High School Dropout Epidemic. Washington: Civic Enterprises, the Everyone Graduates Center at Johns Hopkins University and the America's Promise Alliance.

[2] Mass Insight (2007). "The Turnaround Challenge: Why America's best opportunity to dramatically improve student achievement lies in our worst-performing schools."

Investing prospective flexible federal funds in district or school partnerships with high-quality nonprofit and community-based organizations will build district and school capacity, enabling districts and schools to implement key requirements within the ESEA Flexibility package and dramatically improve student achievement and the school environment.

Nonprofits are prepared to help implement the turnaround principles outlined in the ESEA flexibility package

High-quality nonprofit and community-based organizations are already helping struggling schools around the country to implement many of the turnaround principles outlined in the ESEA flexibility package, including:

- **Using data to inform instruction:** Nonprofit and community-based partners work with educators to analyze the data required to accurately identify students who are at risk of dropping out of school and to deliver the appropriate interventions to ensure that students stay on track to secondary school graduation and post-secondary success;
- **Establishing a school climate that improves school safety and discipline:** Nonprofit and community-based partners deliver school-wide behavior, attendance, and family engagement programs, supporting schools' efforts to build a positive learning environment for students;
- **Strengthening the school's instructional program based on student needs:** Nonprofit and community-based partners that are in the school throughout the school day are able to reinforce classroom curricula, pedagogy, standards and learning practices through evidence-based interventions and extended day programs;
- **Providing additional time for student learning:** Nonprofit and community-based partners provide thousands of hours of additional targeted academic and enrichment activities for students before and after school, and just-in-time tutoring and academic support by working with schools to redesign the school day, week, or year to include additional time for student learning and teacher collaboration; and
- **Providing ongoing mechanisms for family and community engagement:** Nonprofit and community-based partners help schools to reach out to and communicate with students' families and community members by organizing volunteer opportunities and special events.

Recommendations for Implementation of Flexibility Package

As mentioned above, the ESEA Flexibility provides a unique opportunity for states to redirect **Title I funds** previously set aside for **supplemental educational services (SES) and professional development** to support school partnerships with nonprofit and community-based organizations that have a demonstrated record of improving student achievement and implementing the turnaround principles outlined in the ESEA flexibility package, which includes additional time for student learning. In particular, we recommend SEAs set criteria and/or provide guidelines for high-quality expanded learning time with regards to the redesign of the school day and Title I set asides for districts' implementation of the redesign, including providing schools the opportunity to comprehensively redesign and expand their schedules in partnership with non-profit providers that have a demonstrated record of promoting student achievement. High-quality expanded learning time, in contrast to *more of the same* type of instruction[3] offered during the school day, includes:

[3] On February 10th, 2012, the US Department of Education issued *Addendum #3 to FAQ's on ESEA Flexibility.* Section B-24C states, *"What are some examples of ways an eligible entity might use 21st CCLC funds to provide*

- a substantial increase (at least 30 percent more) in total learning time, and enroll all, or a large portion (such as a whole grade level), of a school in the ELT schedule;
- services that integrate academics, enrichment and skills development;
- a range of activities that capture student interest and strengthen student engagement in learning, promote higher class attendance, improve retention and reduce risk for drop out, and make graduation and college and career readiness more likely;
- data on student learning and needs to inform program design and use data to maximize coordination of teaching and support services among teachers, families and community learning partners;
- strong partnerships with community based organizations that:
    - offer students additional time for academic instruction aligned with their academic needs, while also providing engaging enrichment activities that contribute to a well-rounded education;
    - provide administrators, teachers, and community learning partners with increased opportunities to work collaboratively, and to participate in professional development and planning, within and across grades and subjects to improve instruction; and
    - provide students with safe learning environments and additional resources to increase academic achievement and engagement in school.

The ESEA Flexibility also provides local communities more flexibility under the **21st Century Community Learning Center (CCLC) program** to chose the services that best fit local needs, including afterschool, before school, summer, and expanded day, week, or year. In its waiver application, we recommend that states first "check the box" to include the optional 11th waiver in their package of ten waivers. This waiver allows schools to use 21st CCLC funds for afterschool and/or expanded learning time programming. Once granted the waiver, we suggest SEAs release a RFP for CCLC grants that focuses on implementation of the turnaround principles, including high-quality expanded learning time, in priority schools and prioritize new CCLC grants for high-quality partners that have a demonstrated record of improving student achievement in high-needs schools.

Furthermore, ESEA flexibility will allow districts eligible to receive **School Improvement Grant (SIG)** funds to implement a school intervention model in its priority schools, even if those schools would not otherwise qualify the district to receive SIG funds. We recommend flexible SIG funds be deployed to support school intervention models that involve school partnerships with nonprofit and community-based organizations that have a demonstrated record of improving student achievement and implementing the turnaround principles outlined in the ESEA flexibility package. In particular, again, we recommend SEAs set criteria for high-quality expanded learning time with regards to the redesign of the school day and collaboration with partner organizations.

Conclusion

Citizen Schools and its fellow high-performing nonprofit and community-based organizations are already supporting local efforts across the country to ensure that every student graduates from secondary school college-and-career ready. There has been, however, a dearth of funds available to grow and

---

activities that support expanded learning time? Using 21st CCLC funds to support expanded learning time should not be just 'more of the same'; it should involve careful planning by the eligible entity to ensure that the programs or activities will be used to improve student achievement and ensure a well-rounded education that prepares students for college and careers."

sustain this important work within districts – making it difficult for struggling schools to choose to partner with effective nonprofits that could help transform school capacity with additional evidence-based supports. With the ESEA Flexibility package, including local flexibility around federal funding streams, states and districts ought to repurpose funds to support school partnerships with nonprofit and community-based organizations that have a demonstrated record of providing the human capital infusion required to fuel school reform efforts, increase student achievement and wellness, and involve more families in their children's educational outcomes.

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 9:42 AM
To: Lenz, Gene; Green, Cory
Subject: FW: Waiver Request
Attachments: Waiver Request.pdf

Anita

From: Salazar, Dominga [mailto:Dominga.Salazar@fortbend.k12.tx.us]
Sent: Wednesday, September 26, 2012 4:00 PM
To: NCLB
Subject: Waiver Request

This letter is being sent on behalf of Mr. Michael McKie, Acting Superintendent for Fort Bend ISD.

Dominga Salazar
Executive Assistant to the Superintendent
16431 Lexington Blvd.
Sugar Land, TX 77479
281-634-1007
Dominga.salazar@fortbendisd.com

FBISD
A Global Tomorrow

Michael McKie
Acting Superintendent

September 25, 2012

Michael Williams
Commissioner of Education
Texas Education Agency
1701 N. Congress Avenue
Austin, Texas 78701

Commissioner Williams:

Fort Bend Independent School District would like to express its support for the waiver requests to the U. S. Department of Education regarding No Child Left Behind (NCLB).

In the spring of 2012, the Texas Education Agency formed committees to develop a new state accountability system. This new accountability system will emphasize student achievement, student growth, and closing achievement gaps, all of which are fundamental components of NCLB. Thus, it is very appropriate to apply the new state accountability system in lieu of the current Adequate Yearly Progress (AYP) system.

Stakeholders are often confused when a campus receives a state accountability rating of acceptable or recognized but fails to meet Adequate Yearly Progress standards. Because the state and federal accountability programs have different student achievement targets and because NCLB incorporates more student subgroups, it can be difficult for all stakeholders to differentiate and understand the two different systems. A single accountability program will help eliminate confusion between these two systems and allow school leaders to focus on a single set of accountability standards.

If approved, the waiver will allow more flexibility and local control over resources required to address district and school improvement efforts. This, in turn, will allow districts to target areas in need of improvement, focused on adding value, and student achievement.

Fort Bend Independent School District is firmly committed to accountability and believes in the spirit and intent of NCLB. By allowing flexibility in utilizing resources and by allowing a single, uniform system, we will better serve all of our students and stakeholders.

Best regards,

Michael McKie
Acting Superintendent

Fort Bend Independent School District
16431 Lexington Blvd. • Sugar Land, Texas 77479 • 281-634-1007 • Fax 281-634-1700 • *www.fortbendisd.com*

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 9:40 AM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: AFPF-Texas NCLB Waiver Comment
Attachments: Texas NCLB Waiver Comment.pdf

Anita

From: Eliza Vielma [mailto:EVielma@afphq.org]
Sent: Thursday, September 27, 2012 9:30 AM
To: NCLB
Subject: AFPF-Texas NCLB Waiver Comment

September 27, 2012

Texas Educational Agency
1701 Congress Avenue
Austin, TX 78701

Americans For Prosperity Foundation – Texas Comments on Texas Education Agency's Intent to Apply for a Federal Waiver to Provisions of the No Child Left Behind Act of 2001

To Whom It May Concern:

Americans for Prosperity Foundation – Texas (AFPF-TX) is a nonprofit organization comprised of over 120,000 Texans committed to strengthening our constitutional government by limitingfederal overreach into our state's affairs. We have worked to educate our activists and other Texans regarding the performance of their own school districts through the Red Apple Project.

I have worked at the US Department of Education and have served for nine years on the Texas Center for Education Research, an appointee of the Chairman of the State Board of Education.

We applaud the Texas Education Agency's September 6th announcement to apply for a federal waiver to certain provisions of the Elementary and Secondary Education Act as amendment by the No Child Left Behind Act of 2001. Decades of failed federal interventions suggest that returning local control of education to our state would be best for Texas students. At the same time, we recognize that receiving such a waiver is just the first step toward comprehensive education reform and suggest that TEA follows suit by enacting the improvements that Texas students, parents and taxpayers deserve.

A Half-century of Failed Federal Education Policy

Although No Child Left Behind (NCLB) is flawed in and of itself, it is just the latest revision of federal education policy that has been failing American students for 47 years. The passage of the Elementary and Secondary Education Act of 1965 (ESEA) marked the beginning of major federal intervention in the affairs ofstate and local education agencies, providing funding for schools to support the education of schoolchildren from low-income backgrounds. Although rooted in good intentions, ESEA's revisions over the subsequent decades has burdened the states with unattainable benchmarks and threatened our schools with punishment if they fail to meet them.

This strategy has not worked. In fact, the last long-term trend assessment studyconducted by the Department of Education (ED) itself found no significant improvement in academic achievement since the dawn of ESEA. Specifically, student achievement on ED's National Assessment of Educational Progress (NAEP) test improved by only 1 point for reading and 2 points for math among 17-year-olds from 1971 to 2008, despite the enactment of several benchmark-based programs.[1]

Texas has learned this lesson firsthand, with NCLB's unreasonably high Annual Yearly Progress standards strangling our schools. NCLB requires every student in the country to be proficient in reading and mathematics by 2014 and threatens schools with government take-overs if they repeatedly fail to meet this impossible benchmark. While the goal is desirable, this year only 44% of our state's public schools met this requirement, threatening our state's schools with harsh punishments in the imminent future.[2] Clearly NCLB has proven that effective education reform must come from states which have the responsibility for educating their citizens, local schools and education agencies rather than federal mandates that restrain innovation and choice with unrealistic requirements.

Common Core's Strings Attached to NCLB Relief

While the Department of Education under the Obama Administration has begun to recognize NCLB's failure by offering relief from some of its severestrequirements, their September 2011 offer comes with strings attached that that only continues DOEd's failed top-down approach to education. Foremost, education agencies applying for relief are asked to adopt the Common Core State Standards, an effort championed by the Obama Administration to strive for educational uniformity in all 50 states.

Common Core's aim of decreasing student achievement gaps across state lines comes at the expense of local control. The United States' cherished federalist structure limits federal power in favor of allowing states the freedom to provide their citizens more efficient services tailored to local needs. Common Core's one-size-fits-all approach to education runs contrary to this decentralized design by ignoring local problems that state and city governments are more qualified to address than federal bureaucrats thousands of miles away.

The Brooking Institution makes this point powerfully in a recent study where they found that "[m]ost variation on NAEP occurs within states not between them."[3] In fact, "[t]he variation within states is four to five times larger than the variation between states." In plain English, student achievement gaps are wider within states than between them. Thus, Common Core completely ignores a state's internal inequalities in favor of uniform poor achievement across state lines. Worst of all, Common Core is expensive, estimated to cost the states $15.8 billion in the first seven years after its adoption to retrain teachers and buy new technology and textbooks that comply with the national standards.[4]

Texas can do without these national standards tailored to the least common denominator of student achievement among the states. In fact, an April 2010study promoted by TEA concluded that the Texas College and Career Standardsadopted in 2008 "meet and, in many cases, exceed national standards" set by Common Core.[5] Fortunately, Governor Rick Perry has affirmed that Texas will not adopt these ineffective and expensive national standards. TEA's subsequent decision to apply for a waiver directly through NCLB's statutory authority instead of DOEd's strings-attached offer thus affirms Gov. Perry's promise to circumnavigate Common Core.

Section 9401(b)(1) of NCLB allows state educational agencies to directly apply for relief if it details "how the waiving of those requirements will— (i) increase the quality of instruction for students; and (ii) improve the academic achievement of students."[6] By describing both No Child Left Behind and Common Core's failed approach to improving academic achievement, TEA is capable of detailing how such a waiver will improve the instruction and achievement of Texas schoolchildren.

The Future of Effective Educational Reform in Texas

However, TEA should not mistake relief from NCLB's constraining requirements as the end of our state's critical reforms. A NCLB waiver will not heal Texas' educational wound itself but will only stop the bleeding. Instead, citizens and statesmen in Texas should push for further reforms to improve our children's education. AFPF-Texas has been a strong supporter of proven

educational solutions such as lifting our state's cap on charter schools, strengthening parent trigger laws, and tying teacher pay to performance. The last point is particularly pertinent to Texas since our teacher evaluation system is fundamentally broken.

This year, TEA reported that 98% of our state's teachers were evaluated as"proficient" in their annual assessments.[7] Yet, TEA's latest Comprehensive Annual Report on Texas Public Schools reports that only 77% of our state's students passed the Texas Assessment of Knowledge and Skills (TAKS) in 2010.[8] Clearly there is a sizable gap between how our teachers are evaluated and how our schoolchildren perform that needs to be bridged. While the current Texas Teacher Professional Development Appraisal System (PDAS) claims to link evaluations to student performance, the 21% gap between PDAS's teacher "proficiency" and TAKS's student performance suggests room for improvement.

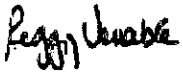
Scholars are reaching a consensus that teacher evaluations are most effective when linked with student performance. Recentstudies by from sources as diverse as the Manhattan Institute[9] and Bill & Melinda Gates Foundation[10] all agree that strongly tying teacher evaluation to student performance has a statistically significant impact on educational outcomes. Considering the strength of theevidence and incredible potential to improve education in our great state, AFPF-Texas suggests that TEA expresses its intent to strengthen PDAS's teacher evaluation on its NCLB waiver application and follow through with such necessary reforms.

Conclusion

While a NCLB waiver is not a long-term solution to resolving the challenges we face in Texas' education system, direct relief from Sec. 9401 statutory authority is a necessary first step. Through relaxing DOEd's grip on our state's educational system, a statutory NCLB waiver would give Texans greater freedom to reform our schools. Moving forward, TEA should seek to implement educational reforms which empower parents -- like lifting our state's cap on charter schools and strengthening parent trigger laws -- and linking teacher pay to performance.

AFPF-Texas recommends legislative reforms which fulfill the waiver requirement to "increase the quality of instruction for students" and "improve the academic achievement of students." In doing so, TEA will set Texas on the right track to returning control of our children's education back in the hands of parents and teachers here in the Lone Star State.

Sincerely,



Peggy Venable
State Director
Americans for Prosperity Foundation– Texas

AFPF-Texas' more than 120,000 activists are committed to strengthening our constitutional government, spending limits and giving taxpayers greater control over how much government we want and are willing to pay for. AFPF supports programs that promote self-reliance and minimize the role of government in our lives and our livelihoods.

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Eliza Vielma
Legislative Affairs & New Media
807 Brazos Street, Ste. 210 | Austin, Texas 78701
T: (512) 476-5905 | C: (512) 619-7459 | E: eliza@afptx.org
@MissLizaface | @TexasAFP | facebook.com/afptx

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[1] "The Nation's Report Card: Trends in Academic Progress in Reading and Mathematics 2008," *National Assessment of Education Progress*, April 2009, http://nces.ed.gov/nationsreportcard/pubs/main2008/2009479.asp.
[2] "2012 AYP requirements rise," *Texas Educational Agency*, August 2012, http://www.tea.state.tx.us/news_release.aspx?id=2147508195.
[3] "2012 Brown Center Report on American Education: How Well Are American Students Learning?," *Brookings Institution*, February 2012, http://www.brookings.edu/~/media/newsletters/0216_brown_education_loveless.pdf.

[4] "National Cost of Aligning States and Localities to the Common Core Standards," *Pioneer Institute & American Principles Project*, February 2012, http://www.pioneerinstitute.org/pdf/120222_CCSSICost.pdf.
[5] "Texas College and Career Readiness Standards more comprehensive than national standards," *Texas Education Agency*, 23 February 2012, http://www.tea.state.tx.us/index4.aspx?id=8061.
[6] "Public Law 107–110," *United States Department of Education*, January 2002, http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf.
[7] "Teacher proficiency numbers and rates," *Texas Education Agency*, January 2012, http://www.tea.state.tx.us/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=2147505007&libID=2147505002.
[8] Texas Education Agency, "2010 Comprehensive Annual Report on Texas Public Schools," December 2010, http://www.tea.state.tx.us/acctres/Comp_Annual_2010.pdf)
[9] Marcus A. Winters. "Transforming Tenure: Using Value-Added Modeling to Identify Ineffective Teachers." *Manhattan Institute for Policy Research*, September 2012, http://www.manhattan-institute.org/html/cr_70.htm#.UGCk7I1lSac.

[10] "Learning about Teaching: Initial Findings from the Measures of Effective Teaching Project," *Bill & Melinda Gates Foundation*, http://www.gatesfoundation.org/college-ready-education/Documents/preliminary-findings-research-paper.pdf.

AMERICANS FOR PROSPERITY FOUNDATION TEXAS

September 27, 2012

Texas Educational Agency
1701 Congress Avenue
Austin, TX 78701

Americans For Prosperity Foundation – Texas Comments on Texas Education Agency's Intent to Apply for a Federal Waiver to Provisions of the No Child Left Behind Act of 2001

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This strategy has not worked. In fact, the last long-term trend assessment study conducted by the Department of Education (ED) itself found no significant improvement in academic achievement since the dawn of ESEA. Specifically, student achievement on ED's National Assessment of Educational Progress (NAEP) test improved by only 1 point for reading and 2 points for math among 17-year-olds from 1971 to 2008, despite the enactment of several benchmark-based programs.[1]

[1] "The Nation's Report Card: Trends in Academic Progress in Reading and Mathematics 2008," *National Assessment of Education Progress*, April 2009, http://nces.ed.gov/nationsreportcard/pubs/main2008/2009479.asp.

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Common Core's aim of decreasing student achievement gaps across state lines comes at the expense of local control. The United States' cherished federalist structure limits federal power in favor of allowing states the freedom to provide their citizens more efficient services tailored to local needs. Common Core's one-size-fits-all approach to education runs contrary to this decentralized design by ignoring local problems that state and city governments are more qualified to address than federal bureaucrats thousands of miles away.

The Brooking Institution makes this point powerfully in a recent study where they found that "[m]ost variation on NAEP occurs within states not between them."[3] In fact, "[t]he variation within states is four to five times larger than the variation between states." In plain English, student achievement gaps are wider within states than between them. Thus, Common Core completely ignores a state's internal inequalities in favor of uniform poor achievement across state lines. Worst of all, Common Core is expensive, estimated to cost the states $15.8 billion in the first seven years after its adoption to retrain teachers and buy new technology and textbooks that comply with the national standards.[4]

Texas can do without these national standards tailored to the least common denominator of student achievement among the states. In fact, an April 2010 study promoted by TEA concluded that the Texas College and Career Standards adopted in 2008 "meet and, in many cases, exceed national standards" set by Common Core.[5] Fortunately, Governor Rick Perry has affirmed that Texas will not adopt these ineffective and expensive national standards. TEA's subsequent decision to apply for a waiver directly through NCLB's statutory authority instead of DOEd's strings-attached offer thus affirms Gov. Perry's promise to circumnavigate Common Core.

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[2] "2012 AYP requirements rise," *Texas Educational Agency*, August 2012, http://www.tea.state.tx.us/news_release.aspx?id=2147508195.

[3] "2012 Brown Center Report on American Education: How Well Are American Students Learning?," *Brookings Institution*, February 2012, http://www.brookings.edu/~/media/newsletters/0216_brown_education_loveless.pdf.

[4] "National Cost of Aligning States and Localities to the Common Core Standards," *Pioneer Institute & American Principles Project*, February 2012, http://www.pioneerinstitute.org/pdf/120222_CCSSICost.pdf.

[5] "Texas College and Career Readiness Standards more comprehensive than national standards," *Texas Education Agency*, 23 February 2012, http://www.tea.state.tx.us/index4.aspx?id=8061.

Section 9401(b)(1) of NCLB allows state educational agencies to directly apply for relief if it details "how the waiving of those requirements will— (i) increase the quality of instruction for students; and (ii) improve the academic achievement of students."[6] By describing both No Child Left Behind and Common Core's failed approach to improving academic achievement, TEA is capable of detailing how such a waiver will improve the instruction and achievement of Texas schoolchildren.

The Future of Effective Educational Reform in Texas

However, TEA should not mistake relief from NCLB's constraining requirements as the end of our state's critical reforms. A NCLB waiver will not heal Texas' educational wound itself but will only stop the bleeding. Instead, citizens and statesmen in Texas should push for further reforms to improve our children's education. AFPF-Texas has been a strong supporter of proven educational solutions such as lifting our state's cap on charter schools, strengthening parent trigger laws, and tying teacher pay to performance. The last point is particularly pertinent to Texas since our teacher evaluation system is fundamentally broken.

This year, TEA reported that 98% of our state's teachers were evaluated as "proficient" in their annual assessments.[7] Yet, TEA's latest Comprehensive Annual Report on Texas Public Schools reports that only 77% of our state's students passed the Texas Assessment of Knowledge and Skills (TAKS) in 2010.[8] Clearly there is a sizable gap between how our teachers are evaluated and how our schoolchildren perform that needs to be bridged. While the current Texas Teacher Professional Development Appraisal System (PDAS) claims to link evaluations to student performance, the 21% gap between PDAS's teacher "proficiency" and TAKS's student performance suggests room for improvement.

Scholars are reaching a consensus that teacher evaluations are most effective when linked with student performance. Recent studies by from sources as diverse as the Manhattan Institute[9] and Bill & Melinda Gates Foundation[10] all agree that strongly tying teacher evaluation to student performance has a statistically significant impact on educational outcomes. Considering the strength of the evidence and incredible potential to improve education in our great state, AFPF-Texas suggests that TEA expresses its intent to strengthen PDAS's teacher evaluation on its NCLB waiver application and follow through with such necessary reforms.

Conclusion

While a NCLB waiver is not a long-term solution to resolving the challenges we face in Texas' education system, direct relief from Sec. 9401 statutory authority is a necessary first step. Through relaxing DOEd's grip on our state's educational system, a statutory NCLB waiver would give Texans greater freedom to reform our schools. Moving forward, TEA should seek to implement educational reforms which empower parents -- like lifting our state's cap on charter schools and strengthening parent trigger laws -- and linking teacher pay to performance.

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[6] "Public Law 107–110," *United States Department of Education*, January 2002, http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf.

[7] "Teacher proficiency numbers and rates," *Texas Education Agency*, January 2012, http://www.tea.state.tx.us/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=2147505007&libID=2147505002.

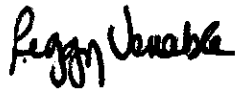
[8] Texas Education Agency, "2010 Comprehensive Annual Report on Texas Public Schools," December 2010, http://www.tea.state.tx.us/acctres/Comp_Annual_2010.pdf)

[9] Marcus A. Winters. "Transforming Tenure: Using Value-Added Modeling to Identify Ineffective Teachers." *Manhattan Institute for Policy Research*, September 2012, http://www.manhattan-institute.org/html/cr_70.htm#.UGCk7111Sac.

[10] "Learning about Teaching: Initial Findings from the Measures of Effective Teaching Project," *Bill & Melinda Gates Foundation*, http://www.gatesfoundation.org/college-ready-education/Documents/preliminary-findings-research-paper.pdf.

AFPF-Texas recommends legislative reforms which fulfill the waiver requirement to "increase the quality of instruction for students" and "improve the academic achievement of students." In doing so, TEA will set Texas on the right track to returning control of our children's education back in the hands of parents and teachers here in the Lone Star State.

Sincerely,



Peggy Venable
State Director
Americans for Prosperity Foundation– Texas

AFPF-Texas' more than 120,000 activists are committed to strengthening our constitutional government, spending limits and giving taxpayers greater control over how much government we want and are willing to pay for. AFPF supports programs that promote self-reliance and minimize the role of government in our lives and our livelihoods.

Americans for Prosperity – Texas • 807 Brazos Street, Austin, Texas 78701
(512) 476-5905 • texas@afphq.org • www.americansforprosperity.org/texas

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 3:02 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: HISD Comments to TEA Waiver Request
Attachments: HISD Comments to TEA Waiver Request 9-27-12.pdf

Anita

From: Garcia, Veronica L [mailto:VGARCI13@houstonisd.org]
Sent: Thursday, September 27, 2012 1:46 PM
To: NCLB
Cc: Pola, Michele
Subject: HISD Comments to TEA Waiver Request

Dear Commissioner Williams,

Attached please find the Houston Independent School District's comments to TEA's Notice of Intent to Apply for Waivers to the U.S. Department of Education. Should you have any questions regarding this letter feel free to contact our office at the number below.

Sincerely,

Veronica L. Garcia, Government Relations Director
Attorney at Law
Houston Independent School District
4400 West 18th Street
Houston, TX 77092
713-556-7203

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HOUSTON INDEPENDENT SCHOOL DISTRICT
HATTIE MAE WHITE EDUCATIONAL SUPPORT CENTER
4400 WEST 18th STREET • HOUSTON, TEXAS 77092-8501

TERRY B. GRIER, Ed.D.
Superintendent of Schools
Tel: 713-556-6300 • Fax: 713-556-6323

September 27, 2012

Mr. Michael Williams
Commissioner of Education
Texas Education Agency
1701 North Congress Avenue
Austin, Texas 78701

Dear Commissioner Williams:

The Houston Independent School District (HISD) appreciates the opportunity to submit comments to the Texas Education Agency's (TEA) Notice of Intent to Apply for Waivers to the U.S. Department of Education (Notice of Intent), dated September 6, 2012. HISD agrees with TEA that the current federal system under the Elementary and Secondary Education Act (ESEA), as amended by P.L. 107-110 No Child Left Behind (NCLB) Act of 2001, is confusing, misleading, and does not adequately reflect the accomplishments of Texas' schools, including those of HISD.

As Texas' largest public school system, and the seventh largest in the United States, HISD is dedicated to giving every student the best possible education through an intensive core curriculum and specialized, challenging instructional and career programs. As such, having the flexibility to exercise local control to ensure that HISD can continue to innovate and create educational programs that best serve HISD students is critical. While HISD agrees that TEA should seek a waiver of certain provisions of ESEA, HISD stresses that the flexibility that TEA seeks should in turn be passed on as flexibility to the local education agencies (LEA).

Below we list the certain sections of ESEA from which TEA intends to seek a waiver along with our comments to these waiver requests:

SECTION 1003(a) REQUIRING TEA TO RESERVE 4% OF ITS TITLE I, PART A ALLOCATION FOR SCHOOL IMPROVEMENT ACTIVITIES AND TO DISTRIBUTE 95% TO LEAS FOR USE IN TITLE I SCHOOLS IN IMPROVEMENT, CORRECTIVE ACTION, AND RESTRUCTURING.

TEA's Notice of Intent states that a waiver from Section 1003(a)would allow TEA to distribute 95%, of the 4% reservation, to Title I schools identified as priority focus, or support schools and for systemic improvement at the LEA level to support the identified schools.

HISD supports the use of Title I School Improvement Program funds at the LEA level as current regulations prohibit such use. However, the Notice of Intent does not indicate what, if any, obligations TEA would impose on school districts that accept such funds. While HISD students would greatly benefit from the use of such funds at the LEA level, HISD does not want for such

benefits to be diminished because of valuable school time and resources that would have to be directed towards additional TEA-imposed requirements.

SECTION 1111(b)(2)(C)(E-H) DEFINING THE CALCULATION OF ADEQUATE YEARLY PROGRESS (AYP), ESTABLISHING OF ANNUAL MEASURABLE OBJECTIVES (PERFORMANCE TARGETS) FOR AYP, 100% PROFICIENCY BY THE END OF 2013-2014, AND IMPLEMENTATION OF THE RESPECTIVE REQUIREMENTS SPECIFIED IN SECTIONS 1111 AND 1116 AND SECTION 1116(a)(1)(A-B) REQUIRING THE LEAS TO MAKE AYP DETERMINATIONS FOR SCHOOLS.

The Notice of Intent indicates that TEA will seek a waiver of the current AYP calculations and performance targets in order to focus on the Texas accountability system. HISD believes that AYP is misleading. Additionally, the current system which includes two different accountability systems, federal and state, each indicating different ratings, is confusing. While HISD supports TEA's waiver request of this provision, HISD continues to have concerns over the state accountability system currently under development. The new state accountability system should accurately reflect student performance and measure for student growth and HISD requests that TEA implement such factors into the state accountability system.

SECTION 1116(b) REQUIRING THE LEA TO IDENTIFY SCHOOLS FOR IMPROVEMENT, CORRECTIVE ACTION, AND RESTRUCTURING WITH CORRESPONDING REQUIREMENTS FOR IMPLEMENTATION.

HISD agrees with TEA's waiver request that would allow it to identify schools for graduated levels of support and intervention based on the state accountability system rather than based on the current AYP regulations. Similar to our previous comment, intervention should be based on the state's system which should accurately reflect student performance and measures for student growth.

SECTION 1116(b)(1)(E) AND (e) AND ALL CORRESPONDING PROVISIONS REQUIRING THE LEA TO OFFER, IN A FEDERALLY PRESCRIPTIVE MANNER, SCHOOL CHOICE FOR SCHOOLS FOR IMPROVEMENT, CORRECTIVE ACTION, AND RESTRUCTURING WITH CORRESPONDING REQUIREMENTS FOR IMPLEMENTATION, AND SECTION 1116(e) REQUIRING THE FEDERALLY PRESCRIPTIVE IMPLEMENTATION OF SUPPLEMENTAL EDUCATIONAL SERVICES UNDER SECTION 1116(b)(5, 7, & 8).

With the waiver of this provision, TEA intends to continue implementation of the two intervention strategies, but redesign, under state-developed procedures, a more effective school choice and supplemental educational services (SES) program that would align to the state's accountability and interventions system. In so doing, HISD stresses the importance of giving school districts more flexibility and allow them to provide SES during the school day using SES funding as well as allow school districts to participate as an SES provider.

The ability to use the SES funding during the school day to provide SES would greatly increase the number of students participating in these services. Many students who would most benefit from SES are economically disadvantaged and it is a financial hardship for them to stay after the regular school day hours to participate in the SES program. It is much more likely that these students would attend and receive supplemental services if they were able to do so during the regular school day. While there may be a concern that providing such services during the school day would supplant instead of supplement a student's educational program, this is not the case. For example, instead of taking an elective class, a student would be required to participate in SES during the school day in an effort ensuring that they received the necessary supplemental services while still participating in their core curriculum classes.

Additionally, HISD recommends implementing quality control over who is allowed to provide SES services. SES providers are not managed nor are they coordinated in partnership with the school district. It is extremely costly to hire outside tutors, and yet most of the providers do not have a relationship with the students; therefore, they do not know the educational history of these students and cannot best serve them. For these reasons, school districts should be allowed to provide SES services to its students. The school district is best situated to know its students and their educational needs.

SECTION 1119 REQUIRING TEA AND LEAS TO DETERMINE HIGHLY QUALIFIED TEACHER (HQT) DETERMINATIONS AND REPORTING, AND SECTION 2141(a, b, AND c) REQUIRING IMPROVEMENT PLANNING AND INTERVENTION REQUIREMENTS.

TEA states that a waiver of this provision would allow TEA to rely on the state's teacher certification standards, which exceed the HQT requirements, based on the state's education evaluation system. HISD takes no issue with TEA's exemption request of this provision so long as it does not usurp a school district's local authority, granted by the Texas Education Code §21.352, to develop its' own appraisal process.

HISD has developed an appraisal system which rates teachers based on multiple measures in three major categories: professional expectations, instructional practice, and student performance. Considering that the HISD appraisal system provides a complete overall picture of a teacher's performance, as well as meaningful feedback and support, along with considering the time and investment made in the development of this system, HISD would not support any proposition that would negatively impact its use of its appraisal system, including a requirement imposed on school districts to establish that their locally developed appraisal system met any state-developed standards. Such a requirement would diminish the school districts' local control.

SECTION 1114(a)(1) REQUIRING THAT A SCHOOL HAVE A POVERTY PERCENTAGE OF 40 PERCENT OR MORE IN ORDER TO OPERATE A SCHOOLWIDE PROGRAM.

TEA's stated intent of seeking a waiver from this provision is to allow LEAs to implement a schoolwide program even if those schools do not have a poverty percentage of 40% or more. HISD supports such a waiver request. While most of the schools within HISD already have a poverty rate of 40% or more, such a waiver would provide HISD with the flexibility to serve students that need such services, even if they happen to be in a school that does not meet the poverty percentage of 40% or more.

SECTION 1117(c)(2)(A) ALLOWING TEA TO RESERVE TITLE I, PART A FUNDS TO REWARD A TITLE I SCHOOL THAT (1) SIGNIFICANTLY CLOSED THE ACHIEVEMENT GAP BETWEEN SUBGROUPS IN THE SCHOOL; OR (2) HAS EXCEEDED AYP FOR TWO OR MORE CONSECUTIVE YEARS.

The Notice of Intent states that TEA seeks a waiver of Section 1117(c)(2)(A) to allow it to use funds reserved under this section for any schools that the state itself determines merits an award. HISD cannot comment on this waiver request without knowing the standards by which TEA would consider awarding such funds. HISD would request that any state developed criteria not exclude large, urban districts or other criteria that would exclude or disadvantage HISD in any way from eligibility for these funds.

SECTION 6123 THAT LIMIT THE AMOUNT OF FUNDS AN SEA OR LEA MAY TRANSFER FROM CERTAIN ESEA PROGRAMS TO OTHER ESEA PROGRAMS UNDER THE FUNDING TRANSFERABILITY PROVISION.

HISD supports TEA seeking a waiver of Section 6123, thereby allowing TEA and LEAs to transfer up to 100 percent of the funds it receives under the authorized programs among those programs and into Title I, Part A. Such an exemption would increase the flexibility of HISD to direct those funds to where most needed.

SECTION 1003(g)(4) AND THE DEFINITION OF A TIER I SCHOOL IN SECTION I.A.3 OF THE SCHOOL IMPROVEMENT GRANT (SIG) FINAL REQUIREMENTS.

TEA seeks a waiver of this provision to allow it to award TTIPS SIG funds to an LEA to implement one of the four SIG models in any of the schools that the state determines are priority schools. Similar to HISD's comments in regards to TEA seeking a waiver from Section 1117(c)(2)(A), HISD cannot comment on TEA seeking a waiver of this particular provision without knowing the criteria by which the state will determine which schools are priority schools. Only after knowing the criteria can HISD analyze the implications for HISD. As previously stated, HISD requests that any state developed criteria not exclude or disadvantage HISD in any way.

SECTIONS 4201(b)(1)(A) AND 4204(b)(2)(A) THAT RESTRICT THE ACTIVITIES PROVIDED BY A COMMUNITY LEARNING CENTER UNDER THE 21ST CENTURY COMMUNITY LEARNING CENTERS (21ST CCLC) GRANT PROGRAM TO ACTIVITIES PROVIDED ONLY DURING NON-SCHOOL HOURS OR PERIODS WHEN SCHOOL IS NOT IN SESSION.

The Notice of Intent states the purpose of seeking a waiver from Sections 4201(b)(1)(A) and 4204(b)(2)(A) is to allow the use of 21st CCLC funds to support expanded learning time during the school day to meet the identified needs of students in addition to activities during non-school hours or periods when school is not in session. HISD supports a waiver from this provision. The ability to use the funds in this manner, if a waiver is granted, provides HISD with the flexibility to supplement the structure of the regular school day program, allows HISD to use funds for extended learning time, and reaches the most students.

SECTION 1113(a)(3-4) AND (c)(1) REQUIRING AN LEA TO SERVE ELIGIBLE SCHOOLS UNDER TITLE I, PART A IN RANK ORDER OF POVERTY AND TO ALLOCATE TITLE I, PART A FUNDS BASED ON THAT RANK ORDERING.

The granting of a waiver from Section 1113(a)(3-4) and (c)(1) would permit LEAs to serve a Title I-eligible high school with a graduation rate below 60% that TEA has identified as a priority school even if that school does not otherwise rank sufficiently high to be served under section 1113.

HISD supports a waiver of this provision as there are times when HISD may determine that a school has a need to receive services; however, they are not at the top of the list which is based on rank order of poverty. HISD submits that not only high schools should be considered, as stated in the Notice of Intent, but also elementary and middle schools. Additionally, HISD would want the flexibility to determine what is considered a priority school as opposed to TEA determining priority status.

We are pleased to work with TEA to address any of the issues raised in this letter. We appreciate the efforts TEA is making to increase flexibility and local control for school districts while also creating a state accountability system that accurately reflects the achievements of Texas' public schools.

Should you have any questions, please feel free to contact me at (713) 556-6300.

Sincerely,

Terry B. Grier, Ed.D.
Superintendent of Schools

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 3:02 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: TAMSA NCLB Waiver Comments
Attachments: TAMSA NCLB Waiver Comments.pdf

Anita

From: Susan Schultz [mailto:susandb7@gmail.com]
Sent: Thursday, September 27, 2012 1:59 PM
To: NCLB
Cc: Dineen Majcher
Subject: TAMSA NCLB Waiver Comments

Attached please find comments to TEA's Notice of Intent to Apply for NCLB Waiver submitted on behalf of Texans Advocating for Meaningful Student Assessment (TAMSA).

Thank you.

Susan B. Schultz

September 27, 2012

Delivered via Electronic Mail: nclb@tea.state.tx.us

Honorable Michael L. Williams
Commissioner of Education
Texas Education Agency
1701 N. Congress Avenue
Austin, Texas 78701

Re: Comments regarding TEA's Notice of Intent to Apply for NCLB Waiver

Dear Commissioner Williams:

We are submitting these comments on behalf of Texans Advocating for Meaningful Student Assessment (TAMSA), a statewide, grassroots organization comprised of concerned parents and other community members. TEA indicates that it will submit its waiver request under the US Department of Education's general authority instead of applying for Secretary Duncan's conditional waiver. The notice notes that "the state recognizes that the lack of NCLB's reauthorization in a timely manner has created an obsolete system that does not adequately reflect the accomplishments of the state's schools." On that point, we agree. Texas should not be subjected to a federal accountability system that is flawed and fails to reflect the multiple ways in which schools succeed.

Similarly, Texas schools should not be subjected to a state accountability system that relies too heavily on a flawed student assessment system. While the State, parents, and taxpayers need a public school accountability system that fairly evaluates schools and school districts, our current system is still a work-in-progress. Our student assessment system in particular is in a period of transition. Over the last several years, the State has had many different assessment systems: TAAS, TAKS – which will continue for 11th and 12th graders for two more years - and now STAAR. STAAR is new, yet in its first year has already generated a tremendous degree of criticism from multiple sources – see for example testimony presented to the House Public Education Committee since January 2012. Based on this legislative record and other sources, a wide variety of public education advocates will be seeking changes to the STAAR system in the upcoming legislative session. Thus, while we support a waiver from NCLB requirements, we do not believe that it should be based on the supposed merits of the STAAR system.

Moreover, it would defeat the purpose of seeking the waiver under the US DOE's general authority if Texas holds up the STAAR system as a condition on which to grant the waiver. To the extent that TEA is seeking the waiver to allow school districts room to breathe from flawed and overreaching federal requirements, TEA should be sensitive to not tying schools and students to costly and overreaching STAAR assessments.

Finally, you stated recently in a public forum that your staff is preparing adjustments to the accountability rubrics. Therefore, we recommend that TEA's request for waiver recognize that Texas has had and will continue to have a strong accountability system but not specify the particular testing regimen, such as TAKS or STAAR. Texas is taking a bold step by seeking this waiver from federal mandates that create duplication and confusion in its public education policies. Now, let's turn our energy to working with schools and school districts to implement an accountability and assessment system that is reasonable and meaningful.

Thank you for the opportunity to provide comment.

Very truly yours,

Dineen Majcher

Dineen J. Majcher
On behalf of TAMSA

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 3:01 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Waiverletter (2)
Attachments: Waiverletter (2).docx

Importance: High

Anita

From: Trevino, Becky [mailto:rtrevino@lfcisd.net]
Sent: Thursday, September 27, 2012 2:33 PM
To: NCLB
Cc: Salazar, Gonzalo
Subject: Waiverletter (2)
Importance: High

Please open attachment.

September 26, 2012

Mr. Michael Williams
Commissioner of Education
1701 N. Congress Ave.
Austin, Texas, 78701-1494

Re: Comment Regarding Notice of Intent to Apply for Waiver to U. S. Department of Education

Commissioner Williams,

The undersigned school district superintendents represent school districts in the Region I area. The demographic of our school districts consists of a student population that is substantially more likely to come from economically disadvantaged backgrounds than the state as a whole. In fact, in 2011-12 ninety-two percent of students in our school districts qualify for Title I assistance, compared to sixty-three percent for all other districts.

We want to take this opportunity to thank you for seeking relief from some of the federal requirements that are no longer working well for Texas school-children. We wholeheartedly support most of the bullet points that you have outlined in your letter of intent to apply for a waiver with the exception of the first bullet. But we strongly disagree with the first bullet point.

The purpose of this letter is to urge you to consider preserving those things about Title I that are working well. Specifically, we are stating that the current method for allocating Title I, Part A dollars should not be changed.

We oppose seeking a waiver from the first bullet of your letter, which reads as follows:

> *"Subpart 2 – Allocations, Sections 1122, 1124, 1124A, 1125, 1125AA, 1125A, 1126, and 1127 requiring TEA to distribute Title I, Part A allocations to eligible LEAs by the statutory formula and any subsequent carryover limitations.*
>
> *Specifically, this waiver would allow TEA to allocate Title I, Part A funds to eligible LEAs based on the identified need of economically disadvantaged, educationally disadvantaged, and English Language Learner students based on state-defined eligibility, distribution formula, and carryover limitations rather than the current federal regulations."*

The federal calculation of Adequate Yearly Progress is no longer an accurate reflection of the progress that school districts are making, and we applaud your efforts to substitute a newly created Texas system for the antiquated AYP calculation that labels an increasing number of successful schools as inadequate. At the same time, we believe that the current mechanism for the allocation of core Title I, Part A funds by counts of low-income students is targeting dollars to students most in need of assistance. A substantial body of research supports the relationship between academic performance and family income. While we know that this relationship can be overcome with effective educational interventions, the Title I dollars that our districts receive are critical to providing those interventions and have long been a part of the success enjoyed by districts in South Texas.

While some have argued for the distribution of funding based on low test performance, or at-risk status, we think that such an approach would be detrimental because it would create a perverse incentive system by rewarding failure and punishing success. It would also prevent sustained academic improvement by withdrawing monetary assistance once a district became successful at improving performance. Districts who use Title I dollars effectively to raise student performance should be allowed to maintain those dollars for continued intervention efforts.

As districts that serve a large proportion of students from economically disadvantaged backgrounds, we would be interested in working with you as you craft the waiver request. We would appreciate the opportunity to assist you in considering the potentially considerable impact of Title I funding changes on our districts.

Thank you for your consideration. We look forward to working with you.

Dr. Carl Montoya, Brownsville ISD

Roberto Loredo, Donna ISD

Frank Perez, Edcouch-Elsa ISD

Dr. Rene Gutierrez, Edinburg CISD

Dr. Steve Flores, Harlingen CISD

Librado De Hoyos, Hidalgo ISD

Pedro Lopez, Jim Hogg County ISD

Dr. Nabor Cortez, La Feria ISD

Dr. Alda Benavides, La Joya ISD

Narciso Garcia, La Villa ISD

Dr. A. Marcus Nelson, Laredo ISD

Sara Alvarado, Lasara ISD

Gonzalo Salazar, Los Fresnos CISD

Eduardo Infante, Lyford CISD

Dr. James Ponce, McAllen ISD

Dr. Daniel Treviño, Jr., Mercedes ISD

Dr. Cornelio Gonzalez, Mission CISD

Donna Hilliard, Monte Alto ISD

Dr. Daniel King, PSJA ISD

Dr. Lisa Garcia, Point Isabel ISD

Dr. Fernando Castillo, Progreso ISD

Johnny Pineda, Raymondville ISD

Roel Gonzalez, Rio Grande City CISD

Anneliese McMinn, Rio Hondo ISD

Jesus Guerra, Jr. Roma ISD

Antonio Limon, San Benito CISD

Miguel Garcia, San Isidro ISD

Albert Peña, San Perlita ISD

Maria J. Chavez, Santa Maria ISD

Heriberto Villarreal, Santa Rosa ISD

Dr. Virginia Richter, Sharyland ISD

Dr. Marla Guerra, South Texas ISD

Roberto J. Santos, United ISD

Leonel Galaviz, Valley View ISD

Dr. Severita Sanchez, Webb CISD

Dr. Ruben Alejandro, Weslaco ISD

Dr. Norma Garcia, Zapata County ISD

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 3:53 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: La Porte Waiver comments

Anita

From: Murray, Vonn [mailto:MurrayV@lpisd.org]
Sent: Thursday, September 27, 2012 3:48 PM
To: NCLB
Cc: Wadleigh, Linda
Subject: La Porte Waiver comments

Mr. Gene Lenz
Director of Federal and State Education Policy
Texas Education Agency
At nclb@tea.state.tx.us
512-463-9114

Dear Mr. Gene Lenz,

La Porte ISD would like to thank Michael L. Williams, Commissioner of Education, for the opportunity to comment of the waiver process.

La Porte ISD agrees with all Potential Waivers, except for one, in the September 6, 2012 letter to the Administrator Addressed for the Notice of Intent to Apply for Waivers to U.S. Department of Education and Opportunity to submit comments

Specifically, we support Item 1. Below , but disagree with the wording that any school could receive Title I, Part A, funds for rewards.

The wording "any school " could mean a non Title I, Part A School. Therefore, we suggest using the wording "any Title I, Part A school" .

Item 1:

Section 1117 (c) (2) (A) allowing TEA to reserve Title I, Part A funds to reward a Title I school that (1) significantly closed the achievement gap between subgroups in the school; or (2) has exceeded AYP for two or more consecutive years.

Your letter says:

Specifically, this waiver would allow TEA to use funds reserved under this section for any school the state determines to reward schools.

In addition, after the general waivers have been approved we request further statewide educator input on the details for the Texas implementation of NCLB/ AYP approved waiver specifics that affect students, parents, teachers, and schools.

Thank you for your time and consideration,

Dr. Vonn Murray
La Porte ISD
Executive Director of Federal/State Programs
and Assessments
1002 San Jacinto Street
La Porte , TX 77571
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Office 281.604.7033
Fax 281.604.7026
Mobile 281.924.4715

The La Porte Independent School District does not discriminate on the basis of race, religion, color, national origin, sex or disability in providing education services, activities, and programs, including vocational programs, in accordance with Title VI of the Civil Rights Act of 1964, as amended; Title IX of the Educational Amendments of 1972; Section 504 of the Rehabilitation Act of 1973, as amended; and Title II of the Americans with Disabilities Act. The Title IX Coordinator is Isela Montes, Executive Director of Human Resources, 1002 San Jacinto, La Porte, Texas 77571, Telephone (281) 604-7110. The Section 504 Coordinator is Dr. April Fox, Executive Director of Special Programs, 1002 San Jacinto, La Porte, Texas 77571, Telephone (281) 604-7034. El Distrito Independiente Escolar de La Porte no discrimina sobre la base de raza, religión, color, origen nacional, sexo u incapacidad para proveer servicios educacionales, actividades y programas, incluyendo programas vocacionales, de acuerdo con el Título VI del Acta de Derechos Civiles de 1964, como fue enmendada; Título IX de las Enmiendas Educacionales de 1972; Sección 504 del Acta de Rehabilitación de 1973, como fue enmendada; y el Título II del Acta de Americanos con Incapacidades. La Coordinadora del Título IX es Isela Montes, Directora Ejecutiva para Recursos Humanos, 1002 San Jacinto, La Porte, Texas 77571, Teléfono (281) 604-7110. La Coordinadora de la Sección 504 es la Dra. April Fox, Directora Ejecutiva de Programas Especiales, 1002 San Jacinto, La Porte, Texas 77571, Teléfono (281) 604-7034.

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the system manager. Please note that any views or opinions presented in this email are solely those of the author and do not necessarily represent those of La Porte I.S.D. Finally, the recipient should check this email and any attachments for the presence of viruses. The company accepts no liability for any damage caused by any virus transmitted by this email.

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 3:54 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Comments regarding ESEA waiver application
Attachments: 09-27-12 ATPE comments on ESEA waiver announcement.pdf

Anita

From: Jennifer Canaday [mailto:jcanaday@atpe.org]
Sent: Thursday, September 27, 2012 3:53 PM
To: NCLB
Subject: Comments regarding ESEA waiver application

Attached please find comments submitted by ATPE regarding the Sept. 6 notice of TEA's intent to apply for waivers. Feel free to contact us for any additional information. Thank you for your consideration.

Kind regards,
Jennifer M. Canaday
Governmental Relations Manager
Association of Texas Professional Educators
305 E. Huntland Drive, Suite 300
Austin, TX 78752
Office: (512) 467-0071, ext. 337

ATPE

ASSOCIATION OF TEXAS PROFESSIONAL EDUCATORS

The Association of Texas Professional Educators (ATPE) offers these comments on the Texas Education Agency's plan to request waivers from federal law.

ATPE supports TEA's decision to apply for waivers of certain provisions of the Elementary and Secondary Education Act (ESEA), more commonly known as the No Child Left Behind (NCLB) Act of 2001. It is difficult to offer specific feedback without seeing the details of the agency's planned waiver request, and we would welcome an opportunity to provide more meaningful input upon viewing the agency's request. In the meantime, ATPE offers the following remarks:

Foremost, ATPE appreciates the agency's desire to create a single system for identification of schools targeted for intervention and thereby minimize the burdens placed on districts to comply with two discrete systems for measuring schools' progress. As the state's largest independent educators association, ATPE's ongoing advocacy work has included urging the U.S. Department of Education and the congressional delegation to ensure that the reauthorization of ESEA will give Texas the flexibility to implement state policy while meeting federal requirements and Education Department goals. Pending reauthorization, we support TEA's intent to request waivers of those ESEA provisions that force districts to be held accountable under multiple, inconsistent standards. At a time when school districts are bearing the burden of the Texas Legislature's decision to cut $5.4 billion from the education budget, it is unfortunate that they are encumbered with duplicative and often confusing federal accountability requirements that are not well aligned with our state laws and regulations.

Indeed Texas has already undertaken significant reforms in the areas of accountability and assessments. ATPE understands that the state's NCLB waiver request will be premised, at least in part, on Texas' recent launch of a new accountability and interventions system based on the new State of Texas Assessments of Academic Readiness (STAAR). We hope that the agency, in seeking waivers of any federal laws that might conflict with or impede the full implementation of the state's accountability reforms, will not rule out the consideration of potential changes that might be necessary to improve our state system, particularly with regard to the use of state standardized tests.

In general, ATPE supports allowing federal funds to be allocated under an equitable formula that will address school districts' highest needs. We also support local control and policies that allow for the customization of fund allocation formulas in recognition of the diversity of our great state.

Regarding the federal "highly qualified teacher" requirements, we believe they are of limited utility in ensuring that all Texas students receive a high-quality education and that our educators are well-prepared to meet the rigors and demands of the classroom. ATPE supports TEA's desire to enable educators in Texas to rely on a single set of teacher certification standards and also to preserve local control. However, we must also note that the state's current minimum standards for admission into the teaching profession and certification are not as high as they should be. We would like to see more focus placed on the preparation of educators prior to their entering the classroom and the support that is given to them in their first few years of teaching.

With respect to Section 1116 of the Act, ATPE is particularly interested in learning more about the agency's intentions to "redesign under state-developed procedures a more effective school choice and supplemental educational services program." We oppose current federal requirements that shift public education funding away from public schools in favor of private entities, and we are concerned that any effort to extend the ESEA's public school choice provisions might force the inclusion of private schools. Additionally, we believe there are better ways for the SES funding to be utilized by public school districts to implement meaningful intervention strategies for struggling students. We hope that this will be addressed in future efforts by Congress to reauthorize the Act, and we urge TEA to remain mindful of our school districts' need to avoid any additional budget cuts in the form of requirements that they pay private entities for services that may already be provided by the public schools.

ATPE would like more information on the state's intended method of identifying "reward schools" that should be entitled to academic achievement award funding pursuant to Section 1117.

Similarly, regarding the transferability options under Section 6123, it is difficult to comment on this without knowing which programs and initiatives TEA intends to fund by way of such transfers if the waiver is granted.

ATPE supports TEA's desire for greater flexibility in interpreting the narrow definition of a Tier I school for purposes of awarding School Improvement Grant (SIG) funds. We are interested in learning more about the method the state will use to identify "priority schools" if the waiver of this provision is granted.

Likewise, we are interested in the agency's plan for identifying "priority schools" for purposes of the rank ordering for the allocation of funds under Section 1113. In general, ATPE supports giving school districts maximum flexibility to distribute funds according to their own unique needs.

Finally, we applaud TEA for seeking flexibility in the use of 21st CCLC grant funds in order to support both in-school and out-of-school activities such as tutoring, counseling, and other strategies for educational development that fall under Part B — 21st Century Community Learning Centers.

ATPE greatly appreciates this opportunity to provide comments on TEA's announcement that it will seek waivers of the ESEA. Requesting waivers of such a significant piece of federal legislation that was developed over the course of several years by members of Congress is no easy task. In accordance with the Sec. 9401 waiver authority granted under the ESEA, we trust that TEA will directly involve local school districts in the development of the formal waiver requests and will formulate those requests in a manner that is responsive to the needs of our school districts. Stakeholder participation in this process is critical, and we welcome any additional opportunities to weigh in on TEA's detailed waiver requests.

For additional information, please contact ATPE Governmental Relations at (800) 777-2783 or *government@atpe.org*.

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 4:04 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: waiver comments

Anita

From: Janna Lilly [mailto:janna@tcase.org]
Sent: Thursday, September 27, 2012 4:01 PM
To: NCLB
Subject: waiver comments

Please see comments below IN RED CAPS from TCASE, Texas Council of Administrators of Special Education.

Subpart 2 – Allocations, Sections 1122, 1124, 1124A, 1125, 1125AA, 1125A, 1126, and 1127 requiring TEA to distribute Title I, Part A allocations to eligible LEAs by the statutory formula and any subsequent carryover limitations.

Specifically, this waiver would allow TEA to allocate Title I, Part A funds to eligible LEAs based on the identified need of economically disadvantaged, educationally disadvantaged, DISABLED and English Language Learner students based on state-defined eligibility, distribution formula, and carryover limitations rather than the current federal regulations.

Section 1111(b)(2)(C)(E-H) defining the calculation of Adequate Yearly Progress (AYP), establishing of annual measurable objectives (performance targets) for AYP, 100% proficiency by the end of 2013-2014, and implementation of the respective requirements specified in Sections 1111 and 1116 and Section 1116(a)(1)(A-B) requiring the LEAs to make AYP determinations for schools.

Specifically, this would allow TEA to submit a waiver of the current AYP calculations and performance targets in order to focus on one robust accountability system (the state system) that meets the intent and purposes of the ESEA statute while aligning to the state's existing systems for reform and interventions to develop new ambitious but meaningful goals to guide the support and improvement of teaching and learning. This waiver request will be submitted in January or February 2013, with the state's Accountability Workbook and when all State Assessments (STAAR) are submitted for peer review. Specifically, waivers will be requested for the following federal requirements:

- Performance Targets/Standard Setting Procedures;
- Use of new Texas accountability system to identify campuses and districts in place of AYP

INCLUDE IN NEW TEXAS ACCOUNTABILITY SYSTEM:

- STUDENTS WITH DISABILITIES AS A SUBGROUP;
- AS LONG AS THE FEDERAL ACCOUNTABILITY SYSTEM INCLUDES A 1 AND 2% CAP, THEN THE STATE SYSTEM MUST ALSO OTHERWISE THE 2 SYSTEMS CREATE A SIGNIFICANT CONFLICT FOR DISTRICTS THAT IMPACTS STUDENT ASSESSMENT DECISIONS;
- PERFORMANCE OF ALL STUDENTS WITH DISABILITIES AS COMPARED TO THE STATE TARGET FOR THIS SUBGROUP PERFORMANCE;
- PERFORMANCE GROWTH MEASURE (INCLUDE A MEASURE OF IMPROVEMENT ACROSS YEARS FOR COHORTS OF STUDENTS);
- GAP REDUCTION MEASURE OVER TIME BETWEEN STUDENTS WITH AND WITHOUT DISABILITIES;

- SIMPLIFIED 1% ALT TEST ADMINISTRATION;
- PARTICIPATION RATES FOR EACH ASSESSMENT OPTION. (PERFORMANCE MUST BE VIEWED IN THE CONTEXT OF PARTICIPATION RATES);
- INCENTIVES FOR APPROPRIATE PARTICIPATION IN GENERAL ASSESSMENT OF STUDENTS WITH DISABILITIES

Thank you for the opportunity to provide comments. Feel free to contact me if you have questions.

Janna Lilly, M.Ed.
Director of Governmental Relations,
Texas Council of Administrators of Special Education, Inc.
406 E. 11th • Suite 312 • Austin, TX 78701
Telephone 512.474.4492 • Toll-free 888.433.4492 • Fax 512.474.9598 • Mobile 325-423-1358
janna@tcase.org
www.tcase.org

Lenz, Gene

From: NCLB
Sent: Thursday, September 27, 2012 5:16 PM
To: Lenz, Gene
Cc: Green, Cory
Subject: FW: Texas AFT Comment on the Commissioner's Sept. 6, 2012, Notice of Intent to Apply for Waivers from U.S.D.E.

Anita

From: Eric Hartman [mailto:ehartman@texasaft.org]
Sent: Thursday, September 27, 2012 4:52 PM
To: NCLB
Cc: ehartman@texasaft.org; lbridges@texasaft.org
Subject: Texas AFT Comment on the Commissioner's Sept. 6, 2012, Notice of Intent to Apply for Waivers from U.S.D.E.

Texas AFT agrees in principle with the commissioner's declared aim of reducing duplication and unnecessary burdens and focusing resources on one coherent system of accountability and improvement. However, we do not believe that the sweeping array of waivers proposed uniformly serves that aim.

For example, it is not obvious that the replacement of federal Title I criteria with unspecified, state-defined regulations of Title I funding distributions would be a step forward. The same concern applies to the proposed waiver regarding permissible uses of school-improvement funds.

The focus of the state's waiver request, in our view, should be on the elimination of conflicts and contradictions between the overlapping federal and state schemes of test-driven accountability and related sanctions. While the state scheme has manifold faults of its own that we and many others will urge the legislature to address in the 2013 state legislative session, in the meantime it would indeed be helpful if NCLB requirements compelling inappropriate testing of students with disabilities, and compelling inappropriate sanctions for school districts and schools that in fact are making meaningful progress, could be waived.

In seeking waivers for relief from these unnecessary and often counterproductive provisions of federal law, however, the Texas Education Agency must not gain latitude to take measures that lie outside the bounds of authority granted to it by the Texas legislature. In this regard, Texas AFT is particularly concerned about the scope of the waiver request to "redesign under state-developed procedures a more effective school choice and supplemental educational services program that would align to the state's accountability and interventions system." It should be clear that a waiver from NCLB requirements regarding "school choice" and "supplemental educational services" does not grant the commissioner and TEA authority to institute any policies or practices not already authorized under state law.

Thank you for the opportunity to comment and for your attention to these comments.

--Comments submitted by Eric Hartman, Texas AFT Director of Government Relations, on behalf of Texas AFT President Linda Bridges

Attachment 3

Notice and Information Provided to the Public

Jason Frizzell
Assistant General Counsel, Contracts
Comptroller of Public Accounts
Filed: September 12, 2012

♦ ♦ ♦

Office of Consumer Credit Commissioner

Notice of Rate Ceilings

The Consumer Credit Commissioner of Texas has ascertained the following rate ceilings by use of the formulas and methods described in §§303.003, 303.005, and 303.009, Texas Finance Code.

The weekly ceiling as prescribed by §303.003 and §303.009 for the period of 09/10/12 - 09/16/12 is 18% for Consumer[1]/Agricultural/Commercial[2] credit through $250,000.

The weekly ceiling as prescribed by §303.003 and §303.009 for the period of 09/10/12 - 09/16/12 is 18% for Commercial over $250,000.

The monthly ceiling as prescribed by §303.005[3] for the period of 09/01/12 - 09/30/12 is 18% for Consumer/Agricultural/Commercial credit through $250,000.

The monthly ceiling as prescribed by §303.005 for the period of 09/01/12 - 09/30/12 is 18% for Commercial over $250,000.

[1] Credit for personal, family or household use.

[2] Credit for business, commercial, investment or other similar purpose.

[3] For variable rate commercial transactions only.

TRD-201204639
Leslie L. Pettijohn
Commissioner
Office of Consumer Credit Commissioner
Filed: September 6, 2012

♦ ♦ ♦

Notice of Rate Ceilings

The Consumer Credit Commissioner of Texas has ascertained the following rate ceilings by use of the formulas and methods described in §§303.003, 303.005, and 303.009, Texas Finance Code.

The weekly ceiling as prescribed by §303.003 and §303.009 for the period of 09/17/12 - 09/23/12 is 18% for Consumer[1]/Agricultural/Commercial[2] credit through $250,000.

The weekly ceiling as prescribed by §303.003 and §303.009 for the period of 09/17/12 - 09/23/12 is 18% for Commercial over $250,000.

[1] Credit for personal, family or household use.

[2] Credit for business, commercial, investment or other similar purpose.

TRD-201204817
Leslie L. Pettijohn
Commissioner
Office of Consumer Credit Commissioner
Filed: September 12, 2012

♦ ♦ ♦

Texas Council for Developmental Disabilities

Requests for Proposals

The Texas Council for Developmental Disabilities (TCDD) announces the availability of funds for 1 project to recruit, engage, empower and support families of children with special needs attending schools in the Educational Service Center Region 17 to become involved with their child's public school.

The Council has approved funding for up to $300,000 per year, for up to 5 years, for the project funded under this Announcement. Funds available for this project are provided to TCDD by the U.S. Department of Health and Human Services, Administration on Intellectual and Developmental Disabilities, pursuant to the Developmental Disabilities Assistance and Bill of Rights Act. Funding for the project is dependent on the results of a review process established by the Council and on the availability of funds. Non-federal matching funds of at least 10% of the total project costs are required for projects in federally designated poverty areas. Non-federal matching funds of at least 25% of total project costs are required for projects in other areas.

Additional information concerning this Request for Proposals (RFP) or more information about TCDD may be obtained through TCDD's website at **http://www.txddc.state.tx.us.** All questions pertaining to this RFP should be directed to Joanna Cordry, Planning Coordinator, at (512) 437-5410 or via email **Joanna.Cordry@tcdd.state.tx.us,** or to Cynthia Ellison, Senior Grants Specialist, at (512) 437-5436 or via email **Cynthia.Ellison@tcdd.state.tx.us.** Application packets must be requested in writing or downloaded from the Internet.

Deadline: One hard copy, with original signatures, and one electronic copy must be submitted. All proposals must be received by TCDD, not later than 4:00 p.m. Central Time, Wednesday, November 21, 2012, or, if mailed, postmarked prior to midnight on the date specified above. Proposals may be delivered by hand or mailed to TCDD at 6201 East Oltorf, Suite 600, Austin, Texas 78741-7509 to the attention of Jeri Barnard. Faxed proposals cannot be accepted. Electronic copies should be addressed to **Jerianne.Barnard@tcdd.state.tx.us.**

Proposals will not be accepted after the due date.

Grant Proposers' Workshops: The Texas Council for Developmental Disabilities will conduct telephone conferences to help potential applicants understand the grant application process and this specific RFP. In addition, answers to frequently asked questions will be posted on the TCDD website. Please check the TCDD website at **http://txddc.state.tx.us/grants_projects/rfp_announcements.asp** for a schedule of conference calls for this RFP.

TRD-201204823
Roger Webb
Executive Director
Texas Council for Developmental Disabilities
Filed: September 12, 2012

♦ ♦ ♦

Texas Education Agency

Public Notice Announcing the Intent to Request Waivers Under P.L. 107-110, the Elementary and Secondary Education Act, as Amended by the No Child Left Behind Act of 2001, Section 9401

Purpose and Scope of the Waiver Requests. The Secretary of Education at the U.S. Department of Education (USDE) may waive any statutory or regulatory requirement of the No Child Left Behind Act of 2001 (NCLB) for a state educational agency, local educational agency (LEA), Indian tribe, or school through a local educational agency that receives funds under a program authorized by the NCLB Act.

The state has long emphasized college and career readiness standards, high-quality assessments, differentiated accountability, and improving teacher quality. However, the state recognizes that the lack of NCLB's reauthorization in a timely manner has created an obsolete system that

does not adequately reflect the accomplishments of the state's schools. This, combined with LEAs being required to meet and function within two different assessment and accountability systems, takes valuable resources and time away from the intent and focus of improving student achievement and school accountability.

Texas has developed and begun full implementation of a statewide system that surpasses the requirements of the Elementary and Secondary Education Act (ESEA), as amended. Specifically, the state has already fully implemented the Texas College and Career Readiness Standards (CCRS) and this year is transitioning to a consolidated, differentiated accountability and interventions system that, upon approval of the waiver request, would be a single differentiated accountability system with tiered interventions beginning in school year 2013-2014. This differentiated accountability system is based on the state's rigorous new assessment system. Also, Texas continues to build upon its stringent teacher certification system that ensures every new certified teacher meets the federal highly qualified teacher requirement to ensure teacher and principal accountability for improved teaching and learning for all students.

Therefore, to further support the implementation of the state's CCRS, the state accountability system, the state assessment system, the Texas accountability intervention system, and the state's teacher certification and principal accountability systems, the Texas Education Agency (TEA) intends to request a waiver of the statutory provisions listed in the September 6, 2012, To The Administrator Addressed letter available at http://www.tea.state.tx.us/taa_letters.aspx to reduce duplication and unnecessary burden on TEA and LEAs. TEA believes that these waiver requests will provide the state and LEAs with the flexibility needed to reduce duplication and unnecessary burden while allowing LEAs to focus resources on one coherent system of accountability and improvement. TEA believes these waivers will increase the academic achievement of students by improving and aligning the quality of instruction with the state's CCRS. LEAs will be better prepared to meet the robust assessment and accountability systems while being supported by the state's intervention and support system.

Texas must ensure in the waiver request that the state has met or will meet all of the eligibility requirements outlined by the USDE and authorized in statute under the ESEA, Section 9401.

Further Information. For more information, contact Gene Lenz, TEA Division of Federal and State Education Policy, by email at nclb@tea.state.tx.us or by telephone at (512) 463-9414.

TRD-201204828
Cristina De La Fuente-Valadez
Director, Rulemaking
Texas Education Agency
Filed: September 12, 2012

♦ ♦ ♦

Texas Commission on Environmental Quality

Agreed Orders

The Texas Commission on Environmental Quality (TCEQ or commission) staff is providing an opportunity for written public comment on the listed Agreed Orders (AOs) in accordance with Texas Water Code (TWC), §7.075. TWC, §7.075 requires that before the commission may approve the AOs, the commission shall allow the public an opportunity to submit written comments on the proposed AOs. TWC, §7.075 requires that notice of the proposed orders and the opportunity to comment must be published in the *Texas Register* no later than the 30th day before the date on which the public comment period closes, which in this case is October 22, 2012. TWC, §7.075 also requires that the commission promptly consider any written comments received and that the commission may withdraw or withhold approval of an AO if a comment discloses facts or considerations that indicate that consent is inappropriate, improper, inadequate, or inconsistent with the requirements of the statutes and rules within the commission's jurisdiction or the commission's orders and permits issued in accordance with the commission's regulatory authority. Additional notice of changes to a proposed AO is not required to be published if those changes are made in response to written comments.

A copy of each proposed AO is available for public inspection at both the commission's central office, located at 12100 Park 35 Circle, Building C, 1st Floor, Austin, Texas 78753, (512) 239-2545 and at the applicable regional office listed as follows. Written comments about an AO should be sent to the enforcement coordinator designated for each AO at the commission's central office at P.O. Box 13087, Austin, Texas 78711-3087 and must be received by 5:00 p.m. on October 22, 2012. Written comments may also be sent by facsimile machine to the enforcement coordinator at (512) 239-2550. The commission enforcement coordinators are available to discuss the AOs and/or the comment procedure at the listed phone numbers; however, TWC, §7.075 provides that comments on the AOs shall be submitted to the commission in **writing.**

(1) COMPANY: Aqua Texas, Incorporated; DOCKET NUMBER: 2012-0606-PWS-E; IDENTIFIER: RN102676723; LOCATION: McLennan County; TYPE OF FACILITY: public water supply; RULE VIOLATED: 30 TAC §290.45(f)(4) and (5), by failing to provide a water purchase contract that authorizes a maximum daily purchase rate or a uniform purchase rate to meet a minimum production capacity of 0.6 gallon per minute (gpm) per connection, and that authorizes a maximum hourly purchase rate plus the actual service pump capacity of at least 2.0 gpm per connection or is at least 1,000 gpm and able to meet peak hourly demands, whichever is less; 30 TAC §290.44(a)(4), by failing to locate the water line a minimum of 24 inches below the ground surface; and 30 TAC §290.42(e)(3)(G), by failing to obtain an exception in accordance with 30 TAC §290.39(l) prior to using any primary disinfectant other than chlorine; PENALTY: $1,860; ENFORCEMENT COORDINATOR: Katy Schumann, (512) 239-2602; REGIONAL OFFICE: 6801 Sanger Avenue, Suite 2500, Waco, Texas 76710-7826, (254) 751-0335.

(2) COMPANY: Aus-Tex Parts & Services, Ltd.; DOCKET NUMBER: 2012-0729-MWD-E; IDENTIFIER: RN102314218; LOCATION: Hays County; TYPE OF FACILITY: wastewater treatment; RULE VIOLATED: TWC, §26.121(a)(1), 30 TAC §305.125(1), and Texas Pollutant Discharge Elimination System (TPDES) Permit Number WQ0014060001, Effluent Limitations and Monitoring Requirements Number 1, by failing to comply with permitted effluent limits; and 30 TAC §305.125(17) and TPDES Permit Number WQ0014060001, Sludge Provisions, by failing to timely submit the annual sludge report for the monitoring period ending July 31, 2011 by September 1, 2011; PENALTY: $13,750; ENFORCEMENT COORDINATOR: Stephen Thompson, (512) 239-2558; REGIONAL OFFICE: 12100 Park 35 Circle, Austin, Texas 78753-3087 (512) 339-2929.

(3) COMPANY: BIVA ENTERPRISES, INCORPORATED dba Papa Keith's 2; DOCKET NUMBER: 2012-1288-PST-E; IDENTIFIER: RN101774818; LOCATION: Huntsville, Walker County; TYPE OF FACILITY: convenience store with retail sales of gasoline; RULE VIOLATED: 30 TAC §334.50(b)(1)(A) and TWC, §26.3475(c)(1), by failing to monitor the underground storage tanks for releases at a frequency of at least once a month (not to exceed 35 days between each monitoring); PENALTY: $3,750; ENFORCEMENT COORDINATOR: Kristyn Bower, (512) 239-2616; REGIONAL OFFICE: 5425 Polk Avenue, Suite H, Houston, Texas 77023-1486, (713) 767-3500.

Attachment 4

Evidence of State Adoption of College- and Career-Ready Content Standards

Attachment 4a

Description of the State's Standards Adoption Process

November 2009
Process for Review and Revision of Texas Essential Knowledge and Skills (TEKS)

Step	Activity
1	Texas Education Agency (TEA) staff notifies public of review process via ListServs and presentations including deadline for applications to serve on TEKS review committees. TEA contacts organizations such as the Texas Association of School Boards (TASB) for assistance in providing information to non-educators.
2	State Board of Education (SBOE) members make SBOE TEKS review committee nominations to include educators, parents, business and industry leaders, and employers. [TEC §28.002(c)] The role of committees is to aid the SBOE in meeting their statutory requirements.
3	TEA notifies SBOE members of their nominations' placement on a TEKS review committee and notifies TEKS review committee members of their appointment. There will be representation from all board members.
4	SBOE may designate up to seven expert reviewers. To be designated, each expert must receive a nomination from at least two board members and a board member may not nominate more than one expert. SBOE determines number of work days needed. The Board may not reject any expert that has been nominated by two or more board members.
5	TEA sends current TEKS to expert reviewers for initial feedback and recommendations.
6	The SBOE provides the charge to the TEKS review committees based on expert recommendations to: - use the current TEKS as the foundation document; - consider the general course of study, not what might be covered in an Advanced Placement course; - consider college readiness standards when revising the TEKS; - ensure revisions are in compliance with all related statutes; - provide justification for all suggested revisions; and - track all revisions to show what has been changed. Any and all documents must be left with TEA staff.
7	TEKS review committee members work face-to-face (which is the preferred method of meeting) or by videoconference if face-to-face is not possible. TEA staff, in consultation with the SBOE, determines the number of work days needed. Work completed at the conclusion of each meeting will automatically be sent to SBOE members.
8	TEA staff prepares draft documents that reflect TEKS review committee recommendations to be posted online for informal feedback.
9	Experts review proposed revisions to TEKS and provide feedback and recommendations.
10	Experts and one representative from each TEKS review committee provide invited testimony at an SBOE meeting.
11	TEA staff receives and compiles informal feedback.
12	TEA staff sends compiled informal feedback and expert recommendations to SBOE members.
13	TEKS review committees reconvene to make additional revisions to TEKS based on expert recommendations and informal feedback. Experts may be invited to this meeting.
14	SBOE discusses comments received from TEKS review committee members, and expert reviewers and directs TEA staff to prepare draft rule text with any requested revisions/edits.
15	SBOE holds a public hearing and completes first reading and filing authorization. (for 30 day official public comment period – Texas Register).
16	SBOE holds second public hearing prior to the end of the 30 day public comment period.
17	TEA summarizes public comments and provides summaries to the SBOE prior to the second reading and final adoption.
18	SBOE members review comments and work on proposed amendments.
19	SBOE members share proposed amendments with one another prior to second reading and adoption.
20	SBOE discusses and completes second reading and adoption of the TEKS with a specified implementation date.

* Updates are provided throughout this process to the SBOE as appropriate and/or upon request by the Chair.

Approved by the State Board of Education, November 20, 2009

Attachment 4b

English Language Arts and Mathematics Gap Analyses

College Readiness English Language Arts and Reading
Vertical Team Phase 2
GAP ANALYSIS

Edwin Wood, Secondary Education Co-Chair
Pat Tyrer, Higher Education Co-Chair

Background/Process:

Phase 2 of the College Readiness Program has been completed as directed by the Third Special Called Session of the 79th Texas Legislature with House Bill 1, which is Section 28.008 of Texas Education Code: "Advancement of College Readiness in Curriculum." A vertical team (VT) of ten members, six representing secondary public education and four representing higher education, was charged with evaluating the degree of alignment between the state's College Readiness Standards (CRS, adopted January 24, 2008) and the Texas Essential Knowledge and Skills (TEKS) for English Language Arts and Reading, Middle School (Sixth, Seventh, Eighth) and High School (I, II, III, IV) and to identify any gaps that may exist. This process is called "gap analysis," and the two documents that the VT was charged with comparing are readily available on the Internet at: www.thecb.state.tx.us/collegereadiness/TCRS.cfm and www.tea.state.tx.us/rules/tac/chapter110/index.html.

Pre-meeting homework was emailed to all team members on September 8, 2008, instructing members to review the CRS and TEKS and rate each of the CRS items as having strong, adequate, or weak alignment with the TEKS. A conference call was held on September 11, 2008, to further explain the homework assignment and provide an overview of the newly revised English Language Arts and Reading TEKS. The ranking system of "strong, adequate, weak" was referred to with the acronym "SAW." In general, the SAW system was used to assess the qualitative degree of strength of the most direct connection between CRS and TEKS, rather than a quantitative count of how many connections of any strength were found. For cases of alignment that were difficult to identify, members were also asked to note if this was due to the nature of the CRS or to the nature of the TEKS.

On September 23-24, 2008, in Austin, Texas, the Phase 2 College Readiness English Language Arts Vertical Team met to discuss the gap analyses that team members had completed as individuals prior to this meeting. Joseph Kulhanek, TEA Director of the College Readiness Program, and Lynette Heckmann, Director of College Readiness Initiatives from the Higher Education Coordinating Board, guided the VT with their task of analyzing and aligning the CRS English Language Arts and Reading Key Contents, Organizing Components, and Performance Expectations with the TEKS for English Language Arts and Reading. An overview of Phase 1 was provided with ample time for additional questions from team members. Sarah Crippen, Director of Language Arts and Reading for the Texas Education Agency, provided an overview of the most recent English Language Arts and Reading TEKS adoption process and explained the legislative intent to incorporate the CRS into the TEKS. Ms. Crippen then introduced Kim Callison

who was on the Phase 1 Team which wrote the CRS. She offered clarification on the intent of the CRS to help the team make a more meaningful assessment of alignment between CRS and TEKS.

Ms. Crippen facilitated the collective VT discussion using the SAW scale and addressing the CRS standards individually and in order. The template was populated in the left-hand column with the CRS. The middle column was used to record the VT's SAW alignment rating and their comments. The right-hand column was used to record the specific parts of the TEKS the VT members found that align with the CRS. While some of this collective feedback was simply "voiced" and recorded by TEA staff, items for which there was no strong consensus yielded on-the-spot discussion to identify and resolve issues. The VT finished this task on the first day. On the second day, the VT reviewed the gap analysis and made minor changes based on further discussion. Comments by team members were recorded and noted on the gap analysis document.

On the second day, September 24, 2008, the VT collaboratively drafted the initial gap analysis report. The gap analysis was emailed to all VT members on September 9, 2008, for review and comment. All VT members had the opportunity to relay to the co-chairs any feedback or corrections via email. Taking into account the discussion and feedback from this stage, the co-chairs finalized the report and submitted it to the agency for posting on the web portal.

Findings and Contextual Comments for Gap Analysis Spreadsheet:

The Phase 2 College Readiness English Language Arts and Reading vertical team members found that the College Readiness Standards in English Language Arts and Reading are well-aligned with the Texas Essential Knowledge and Skills. With minor exceptions, team members generally indicated strong alignment between the CRS and TEKS.

The following are the findings and comments for individual CRS Standards:

CRS I. Writing found to be aligned with English Language Arts and Reading TEKS

- The CRS writing standard can be aligned with TEKS research standards, primarily because of CRS I.A.2.
- CRS I.A.4. The standard refers to revising but not to editing. Alignment was, therefore, limited to TEKS that explicitly mention revising.
- CRS I.A.5. The general phrase "standard English" assumes the more specific details in TEKS 17, 18, 19. "Voice" is taken to mean grammatical person, not speaker's voice.

CRS II. Reading found to be aligned with English Language Arts and Reading TEKS

- CRS II.A.1. TEKS 12, "Media Literacy," includes written texts since it refers to "skills to analyze how words . . . impact meaning." Though CRS says "determine," TEKS 10A, with its emphasis on analyzing and evaluating, is relevant since the tasks are so closely related.
- CRS II.A.3. While knowledge and skills statements for TEKS 2-10 include making inferences, the student expectations do not. The CRS standard refers to "explicit and implicit textual information," but TEKS makes little mention of "explicit" information. "Implicit" cannot be assumed to include "explicit" because a student may understand a literary work's larger, implied meaning without understanding the explicit meaning of each word.
- CRS II.A.4. This standard should be limited to non-fiction texts because of its emphasis on "facts," "assertions," and "opinions."
- CRS II.A.6. Only TEKS that explicitly refer to "imagery" are included here since the CRS II.A.7 refers to the broader term "figurative language."
- CRS II.A.8. The alignment is judged to be merely adequate because of uncertainty about the meaning of the term "generic" in the CRS. According to the CRS examples, "generic features" refers to form, genre, or persona, perhaps intending a distinction between informational and literary texts. Furthermore, while TEKS emphasizes study within various genres, there is little about study across genres.
- CRS II.A.9. Six members voted adequate, primarily because of limited mention of audience in TEKS. Furthermore, while evaluation is a higher-level skill that usually assumes analysis, alignment was limited to TEKS that explicitly say "analyze."
- CRS II.C.3. The alignment was judged merely adequate because the CRS standard emphasizes reading literature in order to understand its historical period,

rather than comparing or contrasting literature from different periods. Alignment is strong in middle school and in English IV, but weak in English I, II, and III.

- CRS II.C.4. Alignment is strong in middle school, adequate in English I and II, but weak in English III and IV.
- CRS II.D.1. The alignment was judged merely adequate because "insights gained about oneself" is weak in TEKS (while the phrase "making connections," found in several TEKS, could include personal insights, this meaning is not clear). Alignment is especially weak in middle school and in English I.
- CRS II.D.2. The alignment is clear in English I, III, and IV, but it is not explicit at other levels. This is understandable since middle school is often teaching the earlier literature that will then become the basis for comparison to later literature in high school.

CRS III. Speaking found to be aligned with English Language Arts and Reading TEKS

- CRS III.A.2. The alignment was judged merely adequate because of insufficient evidence in TEKS to show that students are taught to adjust their presentations.
- CRS III.B.1. The alignment was judged weak because TEKS makes no mention of one-on-one communication.

CRS IV. Listening found to be aligned with English Language Arts and Reading TEKS

- CRS IV.B.2. The alignment was judged weak because TEKS makes no mention of one-on-one communication.

CRS V. Research found to be aligned with English Language Arts and Reading TEKS

- CRS V.A.3. While TEKS does not make explicit reference to devising a research timeline, this may be assumed to be part of developing a research plan.
- CRS V.B.4. While TEKS does not explicitly use the term "ethically," high school TEKS use the term "accurately," and middle school TEKS refer to differentiation between "paraphrasing and plagiarism."
- CRS V.C.2. While TEKS does not explicitly use the term "ethically," high school TEKS use the term "accurately," and middle school TEKS refer to differentiation between "paraphrasing and plagiarism."

Phase 2 Vertical Team members

Higher Education

- Arbolina Jennings, Texas Southern University, Houston
- Elizabeth Kessler, University of Houston, Houston
- Mark Noe, The University of Texas Pan American, Edinburg
- Pat Tyrer, West Texas A&M University, Canyon

Secondary Education:

- Cindy Davis, Winters High School, Winters
- Doloris (Lori) Brown, Winston Churchill High School, San Antonio

- Maria Ludivina Cortez, Nikki Rowe High School, McAllen
- Maggie Portillo, Lee High School, Midland
- Debbie King, Lee High School, Baytown
- Edwin Wood, Bowie High School, Arlington

Texas Education Agency

- Sarah Crippen, Director of English Language Arts and Reading
- Kerry Ballast, Assistant Director of English Language Arts and Reading
- Joseph Kulhanek, Director of the College Readiness Program

Texas Higher Education Coordinating Board

- Lynette Heckman, Director of College Readiness Initiatives
- Evelyn Hiatt, Deputy Assistant Commissioner of P16 Initiatives

English Language Arts Gap Analysis

Organizing Structure: The Texas College Readiness Standards Compared to the Texas Essential Knowledge and Skills for English Language Arts

Texas College Readiness English Language Arts Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for English Language Arts
The English language arts (ELA) College Readiness Standards (CRS) are designed to help students understand the specific content knowledge and academic skills necessary for college readiness. The CRS are broad in nature, equipping students for general education college ELA courses, but are not intended to encompass all skills necessary for students entering majors that require specific ELA knowledge.	**SAW System:** **S=Strong Alignment** **A=Adequate Alignment** **W=Weak Alignment** **For example:** **S9, W1=Nine vertical team members found strong alignment and one found weak alignment**	**As stipulated in the Texas Education Code, school districts are required to provide instruction in essential knowledge and skills at the appropriate grade levels. The English language arts TEKS listed within this column apply to the essential knowledge for middle and high school students.**
I. Writing		
A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose.		
1. Determine effective approaches, forms, and rhetorical techniques that demonstrate understanding of the writer's purpose and audience.	S10	**13a(h), 14ab(m), 15a(h), 16abd(h)**
2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.	S10	**13a(h), 14ab(m), 20a(h), 21b(h), 23c(m), 23d(6,8)**
3. Evaluate relevance, quality, sufficiency, and depth of preliminary ideas and information, organize material generated, and formulate thesis.	S10	**13ab(h), 14ac(m), 15a(h), 16c(11,12), 16d(9,10), 21a(h), 22b(h), 23a(h), 24ab(m)**

Texas College Readiness English Language Arts Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for English Language Arts
4. Recognize the importance of revision as the key to effective writing. Each draft should refine key ideas and organize them more logically and fluidly, use language more precisely and effectively, and draw the reader to the author's purpose.	S10	**13ce(h), 14ce(m), 22ac(h)**
5. Edit writing for proper voice, tense, and syntax, assuring that it conforms to standard English, when appropriate.	S10	**13d(h), 14d(m), 17(h), 18(h), 19abc(m), 19(h), 20(m), 21(m)**
II. Reading		
A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths.		
1. Use effective reading strategies to determine a written work's purpose and intended audience.	S10	**8(h), 9(m), 10a(h), 11a(6), 12cd(9,10,12)**
2. Use text features and graphics to form an overview of informational texts and to determine where to locate information.	S10	**11b(h), 12b(m,h), 13a(6)**
3. Identify explicit and implicit textual information including main ideas and author's purpose.	S10	**8(h), 9(m), 9a(h), 13a(7)**
4. Draw and support complex inferences from text to summarize, draw conclusions, and distinguish facts from simple assertions and opinions.	S10	**8(h), 9ac(h), 10abc(m), 10ab(12), rcd(m), rcab(h)**
5. Analyze the presentation of information and the strength and quality of evidence used by the author, and judge the coherence and logic of the presentation and the credibility of an argument.	S10	**9ad(9,10), 10ab(h), 11ab(m), 12abc(h)**
6. Analyze imagery in literary texts.	S10	**3(9), 4(6), 7(6), 7(12), 8(m), rca(h)c(m)**
7. Evaluate the use of both literal and figurative language to inform and shape the perceptions of readers.	S10	**2c(9,10), 3(9,12), 4(6), 5a(11), 6(8,10), 8(m), rc(m)b**

Texas College Readiness English Language Arts Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for English Language Arts
8. Compare and analyze how generic features are used across texts.	S4, A6. "Generic features" undefined in CRS; TEKS emphasizes genre within rather than across texts.	**2b(h), 3b(m)**
9. Identify and analyze the audience, purpose, and message of an informational or persuasive text.	S4, A6. Minimal mention to audience in TEKS.	**8(h), 9(6,7,8,10), 10a(6,7,8,9,10,12), 11a(8)**
10. Identify and analyze how an author's use of language appeals to the senses, creates imagery, and suggests mood.	S10	**3(9), 6(10,12), 7(11,12), 8(m,11), rca(h)**
11. Identify, analyze, and evaluate similarities and differences in how multiple texts present information, argue a position, or relate a theme.	S10	**2a(10,12)b(12), 3c(6), 9b(12)d(h), 10b(9,11)d(m), 11a(7,8), rcf(m)**
B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.		
1. Identify new words and concepts acquired through study of their relationships to other words and concepts.	S10	**1abc(h)d(9,10,11), 2bcd(m)**
2. Apply knowledge of roots and affixes to infer the meanings of new words.	S10	**1a(h), 2a(m), 2d(8)**
3. Use reference guides to confirm the meanings of new words or concepts.	S10	**1e(h), 2e(m)**
C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods.		
1. Read a wide variety of texts from American, European, and world literatures.	S10	**2b(h), 3(11,12), 3bc(6), 3ab(8), 4(11,12), 5d(h)**
2. Analyze themes, structures, and elements of myths, traditional narratives, and classical and contemporary literature.	S10	**2b(9,11,12), 3b(m), 3ac(7,8), 5abc(12), 6a(6,8)**
3. Analyze works of literature for what they suggest about the historical period and cultural contexts in which they were written.	S3, A7. Alignment is strong in middle school and in English IV, but weak in English I, II, and III. (Standard not mentioned in TEKS at these levels.)	**2c(12), 3c(m)**

Texas College Readiness English Language Arts Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for English Language Arts
4. Analyze and compare the use of language in literary works from a variety of world cultures.	S6, A4. Alignment is strong in middle school, adequate in English I and II, but weak in English III and IV. (Standard not mentioned in TEKS at these levels.)	**2c(9,10), 3abc(m)**
D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances.		
1. Describe insights gained about oneself, others, or the world from reading specific texts.	S2, A8. We found more connections to insights about the world but not as many connections to oneself in TEKS. There is no specific language in middle school through 9th grade that reflects this particular standard in TEKS.	**2a(11), 2c(12), 5b(10,12), rcac(m), rca(h)**
2. Analyze the influence of myths, folktales, fables, and classical literature from a variety of world cultures on later literature and film.	S10. The alignment is clear in English I, III, and IV, but is not explicit in TEKS at other levels. This is understandable since middle school is doing the preparatory work.	**2b(9,11,12)**
III. Speaking		
A. Understand the elements of communication both in informal group discussions and formal presentations (e.g., accuracy, relevance, rhetorical features, and organization of information).		
1. Understand how style and content of spoken language varies in different contexts and influences the listener's understanding.	S10	**25(h)**
2. Adjust presentation (delivery, vocabulary, length) to particular audiences and purposes.	S1, A9. TEKS do not show enough evidence that students are being taught to adjust their presentations.	**25(9,12), 27(m)**
B. Develop effective speaking styles for both group and one-on-one situations.		

Texas College Readiness English Language Arts Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for English Language Arts
1. Participate actively and effectively in one-on-one oral communication situations.	W10. No one-on-one in TEKS.	**None**
2. Participate actively and effectively in group discussions.	S10	**26(h), 28(m)**
3. Plan and deliver focused and coherent presentations that convey clear and distinct perspectives and demonstrate solid reasoning.	S10	**25(h), 27(m)**
IV. Listening		
A. Apply listening skills as an individual and as a member of a group in a variety of settings (e.g., lectures, discussions, conversations, team projects, presentations, interviews).		
1. Analyze and evaluate the effectiveness of a public presentation.	S10	**24b(11,12), 24c(9,10), 26a(m)**
2. Interpret a speaker's message; identify the position taken and the evidence in support of that position.	S10	**24a(h), 26a(m)**
3. Use a variety of strategies to enhance listening comprehension (e.g., focus attention on message, monitor message for clarity and understanding, provide verbal and nonverbal feedback, note cues such as change of pace or particular words that indicate a new point is about to be made, select and organize key information).	S10	**26ac(m), 26(11,12)**
B. Listen effectively in informal and formal situations.		
1. Listen critically and respond appropriately to presentations.	S10	**24a(h), 26a(m)**
2. Listen actively and effectively in one-on-one communication situations.	W10. No one-on-one in TEKS.	**None**

Texas College Readiness English Language Arts Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for English Language Arts
3. Listen actively and effectively in group discussions.	S10	**26(h), 28(m)**
V. Research		
A. Formulate topic and questions.		
1. Formulate research questions.	S10	**20a(h), 20b(9), 22a(m)**
2. Explore a research topic.	S10	**20b(h), 21a(9,11), 22a(m)**
3. Refine research topic and devise a timeline for completing work.	S10	**20b(h), 22a(h)b(m)**
B. Select information from a variety of sources.		
1. Gather relevant sources.	S10	**21a(h), 23a(m)**
2. Evaluate the validity and reliability of sources.	S10	**21a(11,12), 22b(11,12), 24b(m)**
3. Synthesize and organize information effectively.	S10	**21b(h), 22b(h), 24ab(m)**
4. Use source material ethically.	S10	**21c(h), 23d(11,12)e(6,9,10)d(7,8)**
C. Produce and design a document.		
1. Design and present an effective product.	S10	**23abcde(h), 25abcd(m)**
2. Use source material ethically.	S10	**21c(h), 23d(7,8,11,12)e(6,9,10)**

Mathematics Gap Analysis

Organizing Structure: The Texas College Readiness Standards Compared to the Texas Essential Knowledge and Skills for Mathematics

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
The Mathematics College Readiness Standards (CRS) are designed to help students understand the specific content knowledge and academic skills necessary for college readiness. The CRS are broad in nature, equipping students for general education college mathematics courses, but are not intended to encompass all skills necessary for students entering majors that require specific mathematical knowledge.	SAW System: S = Strong Alignment A = Average Alignment W = Weak Alignment For example: S9, A1 = Nine of the ten vertical team members rated the item as having strong alignment and one as average.	As stipulated in the Texas Education Code, school districts are required to provide instruction in essential knowledge and skills at the appropriate grade levels. The mathematics TEKS listed within this column apply to the essential mathematical knowledge for middle and high school students.
I. Numeric Reasoning		
A. Number representation		
1. Compare real numbers.	S8, A2; Irrational numbers are not compared	**6.1ab**cde, **7.1ab**cde, **8.1a**b**cd**e, 2A.2b, A.BU(a)(1), G.BU(a)(1), 2A.BU(a)(1)
2. Define and give examples of complex numbers.	S2, A7, W1; Do we need specificity in TEKS (add to: 2a6c, "roots(real and complex)")	**2A.2b, 2A.6c, 2A.8b,** P.1d
B. Number operations		
1. Perform computations with real and complex numbers.	S5, A5; Operations with complex numbers implicit (add to: 2a6c, "roots(real and complex)")	**6.2abce, 7.2bdef, 8.2a**b, A.4, A.11a, **2A.2, 2A.6c,** M.7a, M.1abc, M.5ab, M6
C. Number sense and number concepts		

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
1. Use estimation to check for errors and reasonableness of solutions.	S10; Implied throughout the high school math courses	**6.2d, 6.8a**, **6.11b**, **7.2c, 7.9ac, 7.13b , 8.2c, 8.14b**c, A.2b, **A.7c, A.8c**, A.BU(a)(5), 2A.BU(a)(5)
II. Algebraic Reasoning		
A. Expressions and equations		
1. Explain and differentiate between expressions and equations using words such as “solve”, “evaluate”, and “simplify”.	S10	**8.5b, A.4ab, A.4, 2A.2a**
B. Manipulating expressions		
1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions).	S7, A3; Embedded throughout algebra 2 and precal	**8.2b, 8.5b, 8.16b, A.4ab**, **2A.2**, 2A.3ab
C. Solving equations, inequalities, and systems of equations		
1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.	S8, A2; Embedded throughout algebra 2 and precal	**7.5a,** 8.3b, A.**4a**b, A.**7b**, A.**8b, 2A.3ab**
2. Explain the difference between the solution set of an equation and the solution set of an inequality.	S3, A7; Implied throughout precal	A.7c, A.8c, 2A.3abc
D. Representations		
1. Interpret multiple representations of equations and relationships.	S10	**6.10a**, 6.12a, **7.5a, 7.11a,** 7.14a, **8.5, 8.12c,** 8.15a, **A.BU(a)(6), G.BU(a)(6), 2A.BU(a)(6)**

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
2. Translate among multiple representations of equations and relationships.	S10	6.10a, 6.12a, **7.5a,** 7.14a, **8.4**, 8.5, 8.14c, 8.15a, A.BU(a)(6), **A.1d**, **A.2c** , A.5c,G.BU(a)(6), 2A.BU(a)(6), **2A.3b, 2A.6b, 2A.8c, 2A.9b, 2A.10d, 2A.11d, G.BU(a)(6), P.2b**
III. Geometric Reasoning		
A. Figures and their properties		
1. Identify and represent the features of plane and space figures.	S10	**6.6abc, 7.6abcd, 7.8abc, 8.6b, 8.7a**bc**, G.4, G.5b, G.6, G.7a, G.9d, 2A.5a,** P.5, M.8, **M.9**
2. Make, test, and use conjectures about one-, two-, and three-dimensional figures and their properties.	S10	(6.13, 7.15, 8.16: the conjectures can be made using geometric patterns and figures; conjectures are implied in modeling and conics); 6.6, 6.7, **6.8a, 7.6d,** 7.8c, **7.15a,** 8.7b, **8.10, G.2, G.9abc**d
3. Recognize and apply right triangle relationships including basic trigonometry.	S10	7.6b, **8.7c, 8.9a, G.5d, G.8c, G.11c,** P.1**, P.3abe, M.8b**
B. Transformations and symmetry		
1. Identify and apply transformations to figures.	S10; Much of this is implicit in elementary grades	**7.7b, 8.6ab, A.6c, A.9bc**d**, 2A.4b, 2A.7**a**b, 2A.9a, 2A.10a, 2A.11b, G.2b, G.5c, G.10a, G.11a**bc**, P.2a, P.6, M.9ab**
2. Identify the symmetries of a plane figure.	S10; Much of this is implicit in elementary grades	**7.7b,** 7.8c, **8.6,** 8.7b, **2A.5c, G.10a, P.1c, M.9b**
3. Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures.	S10	7.7b, 7.8c**, 8.6,** 8.7b**,** 2A.5c, **G.10a,** P.1c, M.9a
C. Connections between geometry and other mathematical content strands		
1. Make connections between geometry and algebra.	S10	**6.4b,** 6.7**, 7.4abc,** 7.7a, MS.I(2), 8.1, 8.7cd, A.BU(a)(5), A.5c, A.6ad, A.10b, **2A.4, 2A.5, G.5ab, G.7bc,** G.8, G.11, **M.8a**

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
2. Make connections between geometry, statistics, and probability.	S6, A4; Make probability expectations explicit	6.9, **6.10a, 7.11a,** 8.11c, **8.12c,** A.2d, G.BU(a)(4), 2A.1b, P.3c, M.2d, M.4b
3. Make connections between geometry and measurement.	S10	**6.8bc, 7.9ac, 8.8abc, 8.9ab, 8.10ab, G.8abd,** G.10ab, **G.11d, P.3e,** P.5, **P.6b**
D. Logic and reasoning in geometry		
1. Make and validate geometric conjectures.	S10	6.6c, **6.13a, 7.15a, 8.16a,** A.6c, A.9bc, **G.1, G.2ab, G.3, G.9, G.10a, G.11a**
2. Understand that Euclidean geometry is an axiomatic system.	S10	**G.1abc, G.3**
IV. Measurement Reasoning		
A. Measurement involving physical and natural attributes		
1. Select or use the appropriate type of unit for the attribute being measured.	S8, A2; Embedded in curriculum; suggested location for change or clarification occur in a6 or a7. This is also a Science student expectation.	**6.8bd,** 7.9a, 8.8, A.BU(a)(1)
B. Systems of measurement		
1. Convert from one measurement system to another.	S8, A2; We should have student expectations at the same time as math and science studies; suggested location for change or clarification occur in g11bd, g8 or in algebra TEKS.	**8.2d,** P.3e
2. Convert within a single measurement system.	S10; Much of this is implicit in elementary grades; modify 7.4a "involving unit conversions within; (Within a single measurement system)	6.4a, **6.8d,** 7.4a, 8.10ab
C. Measurement involving geometry and algebra		

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
1. Find the perimeter and area of two-dimensional figures.	S10	6.4a, **6.8b**, 7.4a, **7.9a**, 8.7c, 8.8a, 8.9b, G.BU(a)(3), G.7c, **G.8,** G.11d
2. Determine the surface area and volume of three-dimensional figures.	S10	**6.8b,** 7.8b, **7.9bc, 8.8abc**, A.BU(a)(3), **2A.BU(a)(4), G.8d**, G.11d
3. Determine indirect measurements of figures using scale drawings, similar figures, Pythagorean Theorem, and basic trigonometry.	S10	**7.3b, 8.6a, 8.7c, 8.9ab,** 8.10ab, **G.5d, G.7c, G.8c,** G.10b, **G.11, P.3**
D. Measurement involving statistics and probability		
1. Compute and use measures of center and spread to describe data.	S8, A2	**6.10b, 7.12ab, 8.12a,** A.2d, 2A.1b, **M.2b**d, M3
2. Apply probabilistic measures to practical situations to make an informed decision.	S6, A4; Probabilistic measures means determine probability from a context involving measurement data.	6.10ad, M.2a, **M.3c, M.4b**
V. Probabilistic Reasoning		
A. Counting principles		
1. Determine the nature and the number of elements in a finite sample space.	S6, A4	**6.9a, 7.10a**, M.4ab
B. Computation and interpretation of probabilities		
1. Compute and interpret the probability of an event and its complement.	S8, A2	**6.9b**, 7.10b, 8.11ab, M.4
2. Compute and interpret the probability of conditional and compound events.	S3, A5, W2	7.10a, **8.11a**

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
VI. Statistical Reasoning		
A. Data collection		
1. Plan a study.	S8, A2	**6.I(a)(2), 6.10ad, 6.11b, 7.I(a)(2), 7.11ab, 7.13b, 8.I(a)(2)**, 8.12bc, 8.13a, **8.14b,** A.BU(a)(5), A.2d, 2A.BU(a)(5), M.3a,
B. Describe data		
1. Determine types of data.	S6, A2, W2; Add "types" of data (quantitative vs. qualitative) in m3a	**6.10a**bd, **7.11a, 8.12a,**
2. Select and apply appropriate visual representations of data.	S10	**6.10**ab**c, 7.11a, 8.12ac**, 8.4, P.3c , M.2ad, M.3b
3. Compute and describe summary statistics of data.	S9, A1	**6.10b, 7.12ab,** 8.12a, M.2b, M.3ab
4. Describe patterns and departure from patterns in a set of data.	S8, A2	6.10, 6.11c, 8.12bc, 8.13ab, 8.16a, A.11c, 2A.9a, **M.2,** M.3c
C. Read, analyze, interpret, and draw conclusions from data		
1. Make predictions and draw inferences using summary statistics.	S9, A1	6.10b, **7.11b,** 8.12b, **8.13a**, A.1be, A.2d, 2A.1b, M.2, M.3c
2. Analyze data sets using graphs and summary statistics.	S10	6.10acd, **7.11a**, **7.12**, **8.12a**b**c**, A.2d, 2A.1b, P.3c, **M.2ab**cd**,** M.3c
3. Analyze relationships between paired data using spreadsheets, graphing calculators, or statistical software.	S8, A2	6.10a, **6.11d**,7.11a, **7.13d**, 8.12bc, **8.14d,** A.2d, **P.3c, M.2**ab**d, M.8a**

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
4. Recognize reliability of statistical results.	S7, A2, W1; One member was concerned about the intent of the word reliability. The CRS use of the word reliability is consistent with a statistician's use of the word validity. After clarity was provided regarding the CRS intent, this member was OK with the alignment.	8.13ab, 8.14d, 8.16b, M.1c, M.2bc, **M.3c**
VII. Functions		
A. Recognition and representation of functions		
1. Recognize whether a relation is a function.	S7, A2, W1	**A.BU(a)(3),** A.1, A.2, **A.5ac**, 2A.1, P.1
2. Recognize and distinguish between different types of functions.	S8, A2; "Type" was interpreted to mean "family" of functions.	**A.2a, 2A.4a, P.1abcde, P.2a**
B. Analysis of functions		
1. Understand and analyze features of a function.	S9, A1	**A.5c, A.6, A.9, A.10b, A.11bc, 2A.1a,** 2A.2b, **2A.7abc, 2A.9a, P.1abcde,** M.2d
2. Algebraically construct and analyze new functions.	S10	**A.3b,** A.5c, **2A.4bc**, **2A.9a, 2A.10a, P.1, P.2a**
C. Model real world situations with functions		
1. Apply known function models.	S10	**A.BU(a)(5),** A.5, A.6, A.9, **A.11a,** 2A.4a, **2A.9f, 2A.10b, 2A.11f,** P.2a, **P.3, M.5a, M.8c**
2. Develop a function to model a situation.	S10	**A.BU(a)(5), A.1bcd,** A.3, A.6a, **A.7a, 2A.1b,** 2A.3a, **2A.8a, 2A.10f, P.I(a)(1), P.3bd, M.2d**

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
VIII. Problem Solving and Reasoning		
A. Mathematical problem solving		
1. Analyze given information.	S9, A1; Embedded in all courses	**6.11b, 7.13b, 8.14bcd, A.BU(a)(3), G.BU(a)(3), 2A.BU(a)(3), A.BU(a)(6), G.BU(a)(6), 2A.BU(a)(6)**
2. Formulate a plan or strategy.	S9, A1; Embedded in all courses	**6.11b, 7.13b, 8.14bcd**, A.BU(a)(3), G.BU(a)(3), 2A.BU(a)(3), A.BU(a)(6), G.BU(a)(6), 2A.BU(a)(6)
3. Determine a solution.	S9, A1; Embedded in all courses	**6.11b, 7.13b, 8.14b**cd, A.BU(a)(3), G.BU(a)(3), 2A.BU(a)(3), A.BU(a)(6), G.BU(a)(6), 2A.BU(a)(6)
4. Justify the solution.	S9, A1; Embedded in all courses	**6.11b, 7.13b, 8.14b**cd, A.BU(a)(3), G.BU(a)(3), 2A.BU(a)(3), A.BU(a)(6), G.BU(a)(6), 2A.BU(a)(6)
5. Evaluate the problem-solving process.	S9, A1; Embedded in all courses	6.11b, 7.13b, 8.14bcd, A.BU(a)(3), G.BU(a)(3), 2A.BU(a)(3), A.BU(a)(6), G.BU(a)(6), 2A.BU(a)(6)
B. Logical reasoning		
1. Develop and evaluate convincing arguments.	S8, A2	**6.13b, 7.15b, 8.16b,** G.BU(a)(6), **G.3bc**e, **G.5,** G.8, G.9, G.10, G.11
2. Use various types of reasoning.	S10	6.11b, 7.13b, 8.14bcd, A.2d, **G.3cde,** G.5b, G.7c, G.8, **G.9, G.10,** G.11, all BU(a)(3), all BU(a)(6)
C. Real world problem solving		
1. Formulate a solution to a real world situation based on the solution to a mathematical problem.	S8, A2	**6.11a, 7.13a, 8.14a, G.5cd, M.1ac, M.2c** d, M.3a

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
2. Use a function to model a real world situation.	S10	**A.BU(a)(5), A.5, A.6, A.9,** A.11a, 2A.4a, 2A.9f, 2A.10b, **2A.11f,** P.2a, **P.3, M.5a, M.8c**
3. Evaluate the problem-solving process.	S10; Embedded in all courses	6.11b, 7.13b, 8.14bcd, all BU(a)(3), all BU(a)(6)
IX. Communication and Representation		
A. Language, terms, and symbols of mathematics		
1. Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem.	S10	**6.4a, 6.5a, 7.4c,** 8.I(a)(3), **8.1d, A.BU(a)(2),** A.BU(a)(6), **A.3a, A2.BU(a)(2),** A2.BU(a)(6)
2. Use mathematical language to represent and communicate the mathematical concepts in a problem.	S10	**6.I(3), 6.12a, 7.I(3), 7.14a, 8.I(3), 8.15a, A.BU(a)(6),** A.6b, **2A.BU(a)(6), G.BU(a)(6), P.I(2)**
3. Use mathematics as a language for reasoning, problem solving, making connections, and generalizing.	S10; Embedded in HS geometry	**6.I(3), 6.12a, 7.I(3), 7.14a, 8.I(3), 8.15a, A.BU(a)(6),** A.3a**, A.5c, A.6b, A.BU(a)(2), 2A.6b, G.BU(a)(6), G.1a**, **G.6a, P.I(2),** M.1c, **M.3b**
B. Interpretation of mathematical work		
1. Model and interpret mathematical ideas and concepts using multiple representations.	S10	**6.10a, 6.12a, 7.11a, 7.14a, 8.12c, A.BU(a)(5), A.1d, A.5c, A.6a, A.8b, A.11b, 2A.BU(a)(5),** 2A.1b, **2A.6b, G.BU(a)(5), M.2a, M.1b,** P.1
2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context.	S10	6.10a, **6.12a, 7.11a, 7.14a, 8.12c, 8.15a,** A.BU(a)(5), A.BU(a)(6), **A.1d, A.5c,** A.6a, A.8a, A.11b, 2A.BU(a)(5), 2A.BU(a)(6)**, 2A.1b, 2A.6b,** G.BU(a)(5), G.BU(a)(6), P.1 , M.1b, **M.2a**
C. Presentation and representation of mathematical work		
1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words.	S10	A.BU(a)(5), **A.BU(a)(6), A.1d, A.5c, A.6a,** A.8ab**, A.11b,** 2A.BU(a)(5), **2A.BU(a)(6), 2A.1b, 2A.6b,** G.BU(a)(5, 6), G.9abcd, P.1, M.1b, M.2ad, **M.3bc**

Texas College Readiness Mathematics Standards	Alignment Rating with Comment	Texas Essential Knowledge and Skills for Mathematics (TEKS)
2. Create and use representations to organize, record, and communicate mathematical ideas.	S10	**6.4ab, 6.10ab, 6.12b, 7.14b, 8.15b, A.BU(a)(5), 2A.BU(a)(5), 2A.BU(a)(6), G.BU(a)(5), G.BU(a)(6),** P.I(2), **M.3b**
3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.	S10	**6.12a,** 6.12b, 7.11b, **7.12b, 7.14a,** 7.14b, **8.12b, 8.15a,** 8.15b, **A.BU(6), 2A.BU(6), G.BU(6), P.I(2), M.I(2), M.1c,** M.3b
X. Connections		
A. Connections among the strands of mathematics		
1. Connect and use multiple strands of mathematics in situations and problems.	S10	6.I(2), 6.4b, 6.7, **6.8bc,** 6.9, **6.10a,** 7.I(2), **7.4ab, 7.7a, 7.9ac,** 7.11a, 8.I(2), **8.7cd, 8.8abc, 8.9ab, 8.10ab, 8.12c, A.BU(a)(5), A.2d, A.5c, A.6ad, A.10b, 2A.1b, 2A.4, 2A.5, G.BU(a)(4),** G.5ab, G.7bc, **G.8b, G.10a, G.11, P.1,** P.3c, **P.3e, P.5,** M.2d, M.3bc, M.4b, M.8A
2. Connect mathematics to the study of other disciplines.	S10	**6.11a, 7.13a, 8.14a, A.BU(6), 2A.BU(6), G.BU(4), G.BU(6), P.3e, M.5, M.6, M.7, M.8, M.9**
B. Connections of mathematics to nature, real world situations, and everyday life		
1. Use multiple representations to demonstrate links between mathematical and real-world situations.	S10	**6.10a, 6.11a, 7.11a, 7.13a, 8.12c, 8.14a,** G.5cd, **P.3c, P.3e, P.4b, P.6b, M.1a**bc, **M.2c, M.2d, M.3a**
2. Understand and use appropriate mathematical models in the natural, physical, and social sciences.	S10	P.3e, **P.4b, P.5abc, P.5d, P.6b,** M.1b, **M.7abc, M.8abc, M.9ab**
3. Know and understand the use of mathematics in a variety of careers and professions.	S8, A2	**6.11a, 7.13a, 8.15a,** M.5c, M.6, M.8a, M.7, M.9ab,

Attachment 4c

Certification of the CCRS by Texas Higher Education Coordinating Board

TEXAS HIGHER EDUCATION COORDINATING BOARD

M I N U T E S

Regular Quarterly Meeting

1200 East Anderson Lane, Austin, Texas

January 24, 2008

The Texas Higher Education Coordinating Board convened at 8:30 a.m. on January 24, 2008, with the following members present: Robert Shepard, presiding; Laurie Bricker; Fred Heldenfels; Joe B. Hinton; Elaine Mendoza; Brenda Pejovich; Lyn Phillips; A.W. "Whit" Riter; and Robert Wingo.

AGENDA ITEM	ACTION
I. Call to order: Opening Remarks and Announcements	Mr. Shepard called the meeting of the Coordinating Board to order.
A. Consideration of resolution of appreciation for Paul Foster's service as a Coordinating Board Member	On motion by Ms. Bricker, seconded by Dr. Phillips, the Board adopted the resolution for Mr. Foster. A copy of the resolution can be found at Attachment A to these minutes.
II. Approval of Minutes	On motion by Mr. Riter, seconded by Ms. Mendoza, the Board adopted the minutes of the October 25, 2007 meeting.
III. Approval of the Consent Calendar	On motion by Mr. Wingo, seconded by Dr. Phillips, the Board approved the consent calendar. Items on the consent calendar were: VI-D; VI-E; VI-F; VIII-H; VIII-I; VIII-J; VIII-K; VIII-N; VIII-O; VIII-P; VIII-Q; VIII-R; VIII-T; and IX-D.
IV. Major Policy Discussion	
A. Discussion on college readiness	No action required.
B. Public Comment relating to the Texas College Readiness Standards (limited time allotted: 3 minutes per person, 21 minutes total)	No action required.

AGENDA ITEM	ACTION
C. Consideration of adopting the Committee's recommendation to the Board relating to Texas College Readiness Standards	On motion by Ms. Mendoza, seconded by Mr. Heldenfels, the Board approved the college readiness standards and authorized the Commissioner to make non-substantive changes to the standards prior to transmitting them to the Commissioner of Education. Additionally there were three other motions made as follows: On motion by Dr. Phillips, seconded by Ms. Bricker, the Board directed the staff to assist public institutions of higher education to prepare for the full implementation of these standards by the Fall of 2012. On motion by Ms. Bricker, seconded by Mr. Wingo, the Board directed the staff to align current assessment instruments used to measure college readiness under the Texas Success Initiative for implementation by 2012. On motion by Ms. Mendoza, seconded by Mr. Heldenfels, the Board directed the staff to create new options for students who are not college ready.
V. Recognition of Excellence	
A. Presentation by Professor Rosemary Karr of Collin County Community College District regarding developmental math education	No action required. Dr. Karr discussed her philosophy for developmental education with an emphasis in mathematics, as well as highlighting a few programs at Collin County Community College.
VI. Matters relating to the Committee on Strategic Planning	
A. Committee Chair's Report	No action required. An update on the Committee's activities was presented to the Board by Mr. Riter, Chair of the Committee on Strategic Planning.
B. Consideration of adopting the Committee's recommendations to the Board relating to construction, rehabilitation, and property purchase projects	
1. <u>The University of Texas MD Anderson Cancer Center</u> Construct Center for Targeted Therapy 1862 East Rd., UT Research Park, Houston, TX 77030	On a motion by Mr. Heldenfels, seconded by Ms. Pejovich, the Board approved the project.
2. <u>University of Houston</u> Purchase MacGregor Park 5000 Block of Martin Luther King Blvd., Houston, TX 77030	On a motion by Ms. Bricker, seconded by Mr. Hinton, the Board approved the project.

AGENDA ITEM	ACTION
C. Actions taken by the Committee on Strategic Planning on construction, rehabilitation, and property purchase projects 1. Texas A&M University Re-approve Construct Wellborn Road Pedestrian Passageway Main Campus, College Station, TX 77840 2. The University of Texas at Austin Re-approve LBJ Plaza Renovation/Lady Bird Johnson Center 2305 East Campus Drive, Austin, TX 78705 3. The University of Texas at Dallas Construct Student Housing/Living Learning Center #1 800 W. Campbell Rd., Richardson, TX 75080 4. The University of Texas Health Science Center at San Antonio Purchase Cancer Therapy and Research Center (CTRC) at UTHSCSA 7979 Wurzbach Road, San Antonio, TX 78229 and 14960 and 14980 Omicron Drive, San Antonio, TX 78245 5. The University of Texas Southwestern Medical Center at Dallas Construct Biotechnology Development Complex – Phase 1 2232 Inwood Rd., Dallas, TX 75390 6. University of North Texas Construct Life Sciences Building UNT Main Campus, Denton, TX 76201 7. University of North Texas Health Science Center at Fort Worth Construct Public Health Education Building 1000 Montgomery Street, Fort Worth, TX 76107	No action required.
D. Consideration of adopting the Committee's recommendation relating to amendments to Section 13.22 (b)(2) of Board rules, concerning Community and Technical College Formulas	This item was approved on the Consent Calendar. A copy of the Board rules as adopted may be found in the agenda materials.
E. Consideration of adopting the Committee's recommendation relating to new Sections 22.501 through 22.508 of Board rules, concerning the grant for Nursing Shortage Reduction Program	This item was approved on the Consent Calendar. A copy of the Board rules as adopted may be found in the agenda materials.
F. Consideration of adopting the Committee's recommendation relating to amendments to Chapter 17 of Board rules, concerning Campus Planning	This item was approved on the Consent Calendar. A copy of the Board rules as adopted may be found in the agenda materials.

AGENDA ITEM	ACTION
G. Update on Texas Higher Education Accountability System	No action required. Janet Beinke, Director of Planning, provided the Board with an update on the Accountability System.
H. Update on Success Goal of Closing the Gaps	No action required. Susan Brown, Assistant Commissioner for Planning and Accountability presented the report to the Board.
I. Legislative Update	No action required. Lora Weber, Director of External Relations provided an update on relevant legislative actions to date.
VII. Executive Session	
The Board will hold a closed session to deliberate the following matters: A. Under Texas Government Code, Section 551.074, the Board will meet in closed session to discuss the personnel evaluation and a proposed salary increase for Raymund Paredes, Commissioner of Higher Education	Closed Session. On motion by Ms. Bricker, seconded by Dr. Phillips the Board approved a salary increase for Commissioner Paredes. A Certified Agenda is on file with these minutes.
VIII. Matters relating to the Committee on Academic Excellence and Research	
A. Committee Chair's Report	No action required. An update on the Committee's activities was presented to the Board by Dr. Phillips, Chair of the Academic Excellence and Research Committee.
B. Presentation on Doctoral Programs in Texas	No action required. Joe Stafford, Assistant Commissioner for Academic Affairs and Research updated the Board on recent procedural initiatives about enhancing doctoral program quality, joint site visits, system review cooperation, and Graduate Education Advisory Committee activities.

AGENDA ITEM	ACTION
C. Consideration of adopting the Committee's recommendation for approval of requests for a new degree program and a new college TEXAS A&M UNIVERSITY SYSTEM HEALTH SCIENCE CENTER 1. Creation of a College of Nursing 2. Bachelor of Science in Nursing (BSN) degree with a major in Nursing TEXAS STATE UNIVERSITY-SAN MARCOS 3. Doctor of Philosophy (PhD) degree with a major in Mathematics Education in Cooperation with Sam Houston State University	On a motion by Ms. Bricker, seconded by Mr. Wingo, the Board approved the request. On a motion by Mr. Heldenfels, seconded by Ms. Mendoza, the Board approved the request.
D. Consideration of adopting the Committee's recommendation for approval of Mission Statements and Tables of Programs for the following general academic institutions: 1. Texas A&M University System Health Science Center 2. Texas Tech University Health Sciences Center 3. University of North Texas Health Science Center at Fort Worth	On motion by Mr. Foster, seconded by Ms. Bricker, the Board approved the requests.
E. Consideration of adopting the Committee's recommendation for approval of preliminary authority requests for the following general academic institutions: SUL ROSS STATE UNIVERSITY – RIO GRANDE COLLEGE 1. Chemistry (bachelor's level) TEXAS A&M UNIVERSITY-CORPUS CHRISTI 2. Communication (master's level)	On motion by Mr. Heldenfels, seconded by Ms. Bricker, the Board approved the preliminary authority requests.
F. Consideration of adopting the Committee's recommendation to the Board relating to a request from B.H. Carroll Theological Institute, Arlington for an amendment to its existing certificate of authority granting degrees in Texas	On a motion by Ms. Bricker, seconded by Ms. Mendoza, the Board approved the request.

AGENDA ITEM	ACTION
G. Consideration of adopting the Committee's recommendation to the Board relating to a request from two private postsecondary education institutions for certificates of authority to grant degrees in Texas: 1. Galen Health Institute, San Antonio 2. Institute for Creation Research, Dallas	On a motion by Ms. Bricker, seconded by Mr. Wingo, the Board approved the request. This item was postponed until the April 2008 board meeting.
H. Consideration of adopting the Committee's recommendation for approval to allow Clarendon College to hold elections to levy a branch campus maintenance tax at its Childress Center in Childress County	This item was approved for adoption on the consent calendar.
I. Consideration of adopting the Committee's recommendation for approval to allow Clarendon College to hold elections to levy a branch campus maintenance tax at its Pampa Center in Gray County	This item was approved for adoption on the consent calendar.
J. Consideration of adopting the Committee's recommendation for approval to allow Weatherford College to hold elections to levy a branch campus maintenance tax for Weatherford College in Wise County	This item was approved for adoption on the consent calendar.
K. Consideration of adopting the Committee's recommendation to the Board relating to amendments to Sections 4.28 and 4.30 of Board rules, concerning the Texas General Education Core Curriculum	This item was approved for adoption on the consent calendar. A copy of the Board rules as adopted may be found in the agenda materials.
L. Consideration of adopting the Committee's recommendation to the Board relating to the State Plan for Perkins IV	On motion by Dr. Phillips, seconded by Ms. Pejovich, the Board tabled this item until the April Board meeting.
M. Consideration of adopting the Committee's recommendation to the Board relating to re-adoption with amendments, pursuant to Section 2001.039 of the Government Code, of Chapter 7 Rules, Private and Out-of-State Public Postsecondary Educational Institutions Operating in Texas	This item was approved for adoption on the consent calendar. A copy of the Board rules as adopted may be found in the agenda materials.
N. Consideration of adopting the Committee's recommendation to the Board relating to the review and re-adoption pursuant to Section 2001.039 of the Government Code of Chapter 8, Creation, Expansion, Dissolution, or Conservatorship of Public Community/Junior College Districts	This item was approved for adoption on the consent calendar. A copy of the Board rules as adopted may be found in the agenda materials.

AGENDA ITEM	ACTION
O. Consideration of adopting the Committee's recommendation to the Board relating to the review and re-adoption pursuant to Section 2001.039 of the Government Code of Chapter 9, Program Development in Public Two-Year Colleges	This item was approved for adoption on the consent calendar. A copy of the Board rules as adopted may be found in the agenda materials.
P. Consideration of adopting the Committee's recommendation to the Board relating to the review and re-adoption pursuant to Section 2001.039 of the Government Code of Chapter 10, Institutional Effectiveness in Public Two-Year Colleges	This item was approved for adoption on the consent calendar. A copy of the Board rules as adopted may be found in the agenda materials.
Q. Consideration of adopting the Committee's recommendation to the Board relating to the review and re-adoption pursuant to Section 2001.039 of the Government Code of Chapter 11, Texas State Technical College System	This item was approved for adoption on the consent calendar. A copy of the Board rules as adopted may be found in the agenda materials.
R. Consideration of adopting the Participation and Success Committee's recommendation to the Board relating to the review and re-adoption pursuant to Section 2001.039 of the Government Code of Chapter 12, Career Schools and Colleges	This item was approved for adoption on the consent calendar. A copy of the Board rules as adopted may be found in the agenda materials.
S. Consideration of adopting the Committee's recommendation to the Board relating to new Sections 22.196 through 22.202 of Board rules, concerning Provisions for Scholarships for Students Graduating in the Top 10 Percent of their High School Class	On a motion by Dr. Phillips, seconded by Ms. Pejovich, the Board tabled this item.
T. Summary of compliance notification resulting from institutional effectiveness evaluation of associate degree-granting institutions	No action required.
IX. Matters relating to the Committee on Participation and Success	
A. Committee Chairman's Report	No action required. An update on the Committee's activities was presented to the Board by Ms. Bricker, Chair of the Participation and Success Committee.
B. Presentation by 2007 Star Award Winners	No action required.
C. Update on College Readiness and Success Initiatives	No action required.

AGENDA ITEM	ACTION
D. Consideration of adopting the Committee's recommendation to the Board relating to amendments to Section 1.18(e)(2) and Section 1.18 (e)(3) of Board rules, concerning operation of Education Research Centers	This item was approved for adoption on the consent calendar. A copy of the Board rules as adopted may be found in the agenda materials.
E. Report on Uniform Recruitment and Retention Strategy	No action required.
F. Reports on the Study on African American Males and the Latina/o Students Higher Education Task Force	No action required.
G. Update on Financial Aid Telethon	No action required.
X. Matters relating to the Committee on Agency Operations	
A. Committee Chair's Report	No action required. An update on the Committee's activities was presented to the Board by Mr. Hinton, Chair of the Agency Operations Committee.
B. Consideration of approving the Committee's recommendation for the appointment of student representatives to the Financial Aid Advisory Committee, the Graduate Education Advisory Committee, the Undergraduate Education Advisory Committee, and the Apply Texas Advisory Committee (Common Application Advisory Committee)	On motion by Mr. Heldenfels, seconded by Ms. Mendoza, the Board approved the Committee's recommendation.
C. Consideration of approving the Committee's recommendation for authorizing the Commissioner to reallocate unused Fiscal Year 2007 Carl D. Perkins Career and Technical Education funds for use in Program Year 2007-2008	On motion by Ms. Bricker, seconded by Dr. Phillips, the Board approved the Committee's recommendation.
D. Consideration of approving the Committee's recommendation regarding a grant award under the Nursing, Allied Health and Other Health-related Grant Program	On motion by Dr. Phillips, seconded by Mr. Wingo, the Board approved the committee's recommendation.
E. List of contracts approved by Commissioner since last Board meeting.	No action required.

AGENDA ITEM	ACTION
F. Report on program and facilities decisions made by the Commissioner or Assistant Commissioner since the previous Board meeting	No action required.

With no further business, on a motion by Mr. Hinton, seconded by Ms. Bricker, the meeting adjourned at 2:08 p.m. on January 24, 2008.

Respectfully Submitted,

Elaine Mendoza
Secretary of the Board

Attachment 4d

Approval of the CCRS by the Texas Commissioner of Education and the Commissioner of Higher Education

AGREEMENT
Postsecondary Readiness Performance Standards
Commissioner of Education and Commissioner of Higher Education
Pursuant to Texas Education Code §39.024 and §39.0241

BACKGROUND

State of Texas Assessments of Academic Readiness (STAAR) End-of-Course (EOC) Performance Standards for English III reading, English III writing, and Algebra II

Texas legislation calls for the State of Texas Assessments of Academic Readiness (STAAR) End-of-Course (EOC) assessments to replace the Texas Assessment of Knowledge and Skills (TAKS) high school tests. Beginning with incoming ninth-grade students in the 2011–2012 school year, requirements specific to the STAAR EOC program will be used to determine eligibility for high school graduation and as an exemption for college remediation under the Texas Success Initiative (TSI) instead of the current TAKS program. These performance standards are also expected to be used for state and federal accountability purposes beginning in the 2012–2013 school year.

As part of the implementation of the STAAR EOC assessment program, performance standards (or cut scores) were set for each STAAR EOC assessment to establish the following performance categories:

- Level III: Advanced Academic Performance
- Level II: Satisfactory Academic Performance
- Level I: Unsatisfactory Academic Performance

The policy definitions for each of the performance categories are as follows:

<u>Level III: Advanced Academic Performance</u>*
Performance in this category indicates that students are well prepared for the next grade or course. They demonstrate the ability to think critically and apply the assessed knowledge and skills in varied contexts, both familiar and unfamiliar. Students in this category have a high likelihood of success in the next grade or course.

* For Algebra II and English III, this level of performance also indicates students are well prepared for postsecondary success.

<u>Level II: Satisfactory Academic Performance</u>**
Performance in this category indicates that students are sufficiently prepared for the next grade or course. They generally demonstrate the ability to think critically and apply the assessed knowledge and skills in familiar contexts. Students in this category have a reasonable likelihood of success in the next grade or course.

** For Algebra II and English III, this level of performance also indicates students are sufficiently prepared for postsecondary success.

<u>Level I: Unsatisfactory Academic Performance</u>

Performance in this category indicates that students are inadequately prepared for the next grade or course. They do not demonstrate a sufficient understanding of the assessed knowledge and skills. Students in this category are unlikely to succeed in the next grade or course without significant, ongoing academic intervention.

According to current legislation, postsecondary readiness is the level of preparation a student must attain in English language arts and mathematics courses to enroll and succeed, without remediation, in an entry-level general education course for credit in that same content area for a baccalaureate degree or associate degree program or for certificates or credentials other than baccalaureate or advanced degrees as described in Texas Education Code §39.024(a).

It should be noted, however, that the measurement of postsecondary readiness through the Algebra II and English III assessments will be only one piece of information that students, parents, and schools will have in making readiness determinations. Algebra II and English III are courses students typically take in grade 11; after students have taken these assessments and potentially met the Level II or Level III performance standards, they will continue to take higher-level courses (i.e., calculus, English IV, and rigorous career/technical education courses) in grade 12. Students will need to continue to acquire content knowledge to fully prepare for postsecondary success.

A nine-step process was developed to set the STAAR EOC performance standards. Table 1 provides a summary of the STAAR EOC standard-setting process conducted by the Texas Education Agency in collaboration with Texas Higher Education Coordination Board staff. Two key steps in the process (Step 4, the policy committee, and Step 5, the standard-setting committees) involved convening committees of stakeholders to provide recommendations for the STAAR EOC performance standards. The policy committee met February 1–2, 2012. This committee included policy experts, legislative staff, business and workplace leaders, and secondary- and higher-education representatives. The group reviewed the results from empirical research studies, considered the policy implications of the performance standards, and made recommendations to identify reasonable ranges ("neighborhoods") for the cut scores on all STAAR EOC assessments.

Standard-setting committees for English and mathematics met February 22–24, 2012. The committees consisted of secondary- and higher-education representatives. Each committee was provided with the neighborhoods recommended by the policy committee to help inform cut-score recommendations.

Level II and Level III Standards for English III Reading, English III Writing, and Algebra II

The foundation of both the STAAR EOC assessments and the new TSI Assessment currently under development by the Texas Higher Education Coordinating Board is the Texas College and Career Readiness Standards (CCRS) adopted in 2008 by the Coordinating Board and the Commissioner of Education. To assist in this work, educator teams composed of public and higher education faculty identified critical Texas Essential Knowledge and Skills standards associated with performance expectations outlined in the CCRS in English III and Algebra II. These critical TEKS formed the basis for the readiness standards of the new EOC assessments for English III Reading, English III Writing, and Algebra II and are an essential part of the new TSI Assessment.

The final cut scores established by the commissioner of education in April 2012 per TEC §39.0241 are the performance standards recommended by the policy committee and the standard setting committees for English III reading, English III writing, and Algebra II STAAR EOC assessments for Level II: Satisfactory Academic Performance and Level III: Advanced Academic Performance. These standards are as follows:

STAAR Assessment	Final Recommended Level II	Final Recommended Level III
English III reading	2000	2356
English III writing	2000	2300
Algebra II	4000	4411

Texas Success Initiative (TSI)

The TSI requires students to be assessed in reading, writing, and mathematics skills prior to enrolling in all public institutions of higher education in Texas to determine when they are ready for college-level coursework. Based on a student's performance on this assessment(s) the student may need developmental education, tutoring, or supplemental instruction before enrolling in credit bearing courses. Students are exempt from taking a test for the TSI if a qualifying score has been achieved on TAKS, STAAR, the SAT, or the ACT.

The commissioner of higher education has designated the final recommended Level II cut scores on STAAR English III reading, English III writing, and Algebra II as the initial postsecondary readiness thresholds to use as qualifying scores for TSI exemption purposes. The commissioner of education concurs with this designation.

Several factors were considered in selecting the Level II standards as the initial postsecondary readiness performance standards on English III reading, English III writing, and Algebra II STAAR EOC assessments at the Level II: Satisfactory Academic Performance standard.

First, the initial data available from the external studies conducted to date indicate that students achieving Level II: Satisfactory Academic Performance are approximately 70% likely to be sufficiently prepared for postsecondary success. Available data currently show that the final

Level II standards for Algebra II and English III are similar to the level of performance required to be labeled Proficient by the National Assessment of Educational Progress (NAEP) and are generally higher than the scores currently used to satisfy the TSI (e.g., TAKS HERC, THEA, ACCUPLACER, SAT, ACT). A 2012 research study conducted by the Educational Testing Service showed that students who achieved the proficient level on NAEP were prepared for college entry, course placement, and entry into the workforce. Additionally, these levels of performance indicate at least a 70% likelihood of earning a grade of C or better in Texas institutions of higher education based on studies that included samples of students enrolled in Texas two-year and four-year institutions.

Second, the initial data available from the external studies conducted to date indicate that students achieving Level III: Advanced Academic Performance are approximately 90% likely to be well prepared for postsecondary success. The final Level III standards for Algebra II and English III are higher than the current ACT and SAT college readiness benchmarks and indicate at least a 90% likelihood of earning a C or better in Texas institutions of higher education based on studies that included samples of students enrolled in Texas two-year and four-year institutions.

Third, TEA and THECB will continue to gather data to support the performance standards including data from longitudinal studies of STAAR performance and studies evaluating the relationship between performance on the STAAR assessments and success in military service or workforce training, certification, or other credential programs. TEA and THECB will follow students from the entering 9th grade STAAR cohort in 2011–2012 and review their actual STAAR performance as juniors (in 2013–2014) compared with their first year performance in college and technical programs (in 2015–2016). Performance data from these students and subsequent cohorts will inform the performance standards reviews.

Review of STAAR EOC Performance Standards

Per legislative requirements, the performance standards will be formally reviewed at least once every three years. The commissioner of education and the commissioner of higher education will also conduct a reasonableness review of the standards on an annual basis. During both the annual data review and formal standards review, TEA and THECB will examine additional impact and validity-study data. The reviews will include data from longitudinal studies and studies evaluating the relationship between performance on the STAAR assessments and the TSI assessment exemption standards and success in military service or workforce training, certification, or other credential programs. This ongoing review process will provide TEA and THECB additional information to verify whether the established performance standards are appropriate or should be adjusted.

New TSI Assessment(s)

The THECB is in the process of developing a new TSI assessment(s) to determine the readiness of students to perform freshman-level academic coursework. All first time college students enrolling in Texas public institutions of higher education in fall 2013 will be required to meet the standards on this new assessment unless they are otherwise exempt.

This will necessitate the identification of scores on this new assessment that are equivalent to the final recommended Level II and Level III cut scores on the STAAR assessments to ensure that Texas public high school students are meeting a standard that is equivalent to satisfactory performance on STAAR.

TEA and THECB staff will jointly examine data designed to identify the equivalent standards on the two assessments and the results of that examination will be presented to the Texas Higher Education Coordinating Board to inform THECB's determinations of standards for the new TSI assessment(s). THECB staff, in collaboration with TEA, will also conduct an annual reasonableness review of the new TSI assessment standards to verify whether the established performance standards are appropriate or should be adjusted.

Finally, data sharing across agencies will support valid and defensible performance standards for both the new TSI assessment(s) and the STAAR EOC assessments. Specifically, TEA will provide student-level STAAR EOC assessment results to THECB staff, for the purpose of linking students' STAAR scores to their scores on the new TSI assessments. As annual reasonableness reviews are conducted, additional years of STAAR EOC assessment data will be available to inform adjustments if necessary. In addition, to support TEA's fall 2014 standards review for STAAR EOC assessments, THECB will provide student-level results from the new TSI assessment to inform adjustments to STAAR EOC performance standards if necessary.

By our signatures, we affirm our agreement and approval of the following effective through August 2015 unless, however, in the judgment of the Commissioner of Higher Education, the TSI requirements to be adopted by the Coordinating Board in 2013 cannot be reasonably aligned with the Level II cut scores on the Algebra II and English III STAAR end-of-course assessments, in which event this agreement shall be revised in a manner agreeable to both commissioners:

1. The final cut scores recommended by the policy committee for English III reading, English III writing, and Algebra II STAAR EOC assessments for Level II: Satisfactory Academic Performance and Level III: Advanced Academic Performance.
2. The scores identified as the final recommended Level II cut scores on the Algebra II and English III end-of-course assessments will qualify a student for exemption from the TSI requirements under Section 51.3062(q-1), Texas Education Code, for students first entering grade 9 in the 2011-12 school year or thereafter if this agreement remains unchanged, and until revised by the Commissioner of Education and Commissioner of Higher Education. The Commissioner of Education and the Commissioner of Higher Education shall work to ensure these scores are aligned with the TSI requirements to be adopted by the Coordinating Board in 2013. The Commissioner of Higher Education will set a period for which an individual student's exemption is valid.
3. The joint annual review and three-year reviews of the EOC performance standards for STAAR English III reading, English III writing, and Algebra II and the TSI exemption standards for the new TSI assessment(s).

4. This agreement applies to Texas public school students for whom STAAR is the graduation requirement and who first attempt a STAAR EOC for Algebra II or English III on or before August 17, 2015 and for any subsequent retests of those assessments.
5. In the event this agreement is revised in 2013 in accordance with its terms, the Commissioner of Education and the Commissioner of Higher Education shall work to ensure the Level II cut scores on the Algebra II and English III STAAR end-of-course assessments are aligned with the TSI requirements adopted by the Coordinating Board since such scores will qualify a student for exemption from the TSI requirements.

The terms of this agreement may not be altered during the term hereof unless the Commissioner of Education and the Commissioner of Higher Education agree to modify these EOC standards and their use based on continuing research per TEC §39.0242(c)(d) and §51.3062.

Michael L. Williams
Commissioner of Education
Texas Education Agency

1/10/2013
Date

Raymund A. Paredes
Commissioner of Higher Education
Texas Higher Education Coordinating Board

January 9, 2013
Date

TABLE 1: STAAR EOC STANDARD-SETTING PROCESS

Standard-Setting Step	Description	Timeline
1. Conduct validity and linking studies	External validity evidence was collected to inform standard setting and support interpretations of the performance standards. Scores on each assessment were linked to performance on other assessments in the same content area.	Studies started in spring 2009 and will continue throughout the program.
2. Develop performance labels and policy definitions	Committee convened jointly by TEA and THECB to recommend performance categories, performance category labels, and general policy definitions for each performance category.	September 2010
3. Develop grade/course specific performance level descriptors (PLDs)	Committees consisting primarily of educators developed performance level descriptors (PLDs) as an aligned system, describing a reasonable progression of skills within each content area (English, mathematics, science, and social studies).	November 2011
4. Convene policy committee	Committee considered policy implications of performance standards and empirical study results and made recommendations to identify reasonable ranges ("neighborhoods") for the cut scores.	February 1–2, 2012
5. Convene standard-setting committees	Committees consisting of K–12 educators and higher education faculty used the performance labels, policy definitions, specific PLDs, and neighborhoods set by the policy committee to recommend cut scores for each STAAR EOC assessment.	Mathematics and English: February 22–24, 2012 Science and Social Studies: February 29–March 2, 2012
6. Review performance standards for reasonableness	TEA and THECB reviewed the cut-score recommendations across content areas.	Early March 2012
7. Approve performance standards	The Commissioner of Education (and Commissioner of Higher Education for postsecondary readiness standards) will approve performance standards.	April 2012
8. Implement performance standards	Performance standards will be reported to students after the spring 2012 administration with phase-in standards applied.	May 2012
9. Review performance standards	Performance standards will be reviewed at least once every three years.	Fall 2014

Attachment 4e

State Board Action to Incorporate the CCRS into Curriculum Standards

Mathematics

Minutes
State Board of Education
January 23, 2009

The State Board of Education met at 9:02 a.m. on Friday, January 23, 2009, in the State Board of Education Room, #1-104, of the William B. Travis Building, 1701 N. Congress Avenue, Austin, Texas. All members of the board were present, as follows:

Presiding: Don McLeroy, Chair; Rick Agosto; Lawrence A. Allen, Jr., Vice Chair; Mary Helen Berlanga; David Bradley; Barbara Cargill; Bob Craig; Cynthia Dunbar; Pat Hardy; Mavis B. Knight; Terri Leo, Secretary; Gail Lowe; Ken Mercer; Geraldine Miller; Rene Nuñez

Student Performance

The student performance was provided by the Mainland Preparatory Academy, La Marque, Texas.

Invocation

Pledge of Allegiance

Approval of Minutes

State Board of Education, November 21, 2008

MOTION AND VOTE: *It was moved by Mr. Craig and carried unanimously to approve the Minutes of the November 21, 2008, meeting of the State Board of Education, as printed.*

Public Testimony

Individual testimony will be taken to address items other than those on the board agenda.

The State Board of Education received no presentations of public testimony.

1. Resolutions and Presentations

Teacher of the Year

Mrs. Leo read the resolution, which the State Board of Education adopted by unanimous consent, congratulating Christine Gleason and Dora Newell on their selection as Texas Teachers of the Year.

(ATTACHMENT 1, page 13)

Presidential Awards for Excellence in Mathematics and Science Teaching

Mrs. Leo read the resolution, which the State Board of Education adopted by unanimous consent, recognizing outstanding mathematics and science teachers in elementary and secondary schools identified as state and national finalists for the 2008 Presidential Awards for Excellence in Mathematics and Science Teaching program.

(ATTACHMENT 2, page 15)

2. Approval of Consent Agenda

Any agenda item may be placed on the consent agenda by any State Board of Education committee. The State Board of Education may elect to take separate action on any item on the consent agenda.

In addition to the items on the original consent agenda, the following agenda items received unanimous approval in committee and were brought forward to the consent agenda for board approval:

- Official Agenda Item #5—Adoption of the Review of 19 TAC Chapter 30, Administration, Subchapter A, State Board of Education: General Provisions, and Proposed Amendment to 19 TAC §30.1, Petition for Adoption of Rule Changes
- Official Agenda Item #13—Proposed Amendment to 19 TAC Chapter 129, Student Attendance, Subchapter B, Student Attendance Accounting, §129.21, Requirements for Student Attendance Accounting for State Funding Purposes
- Official Agenda Item #14—Adoption of the Review of 19 TAC Chapter 30, Administration, Subchapter B, State Board of Education: Purchasing and Contracts, and Proposed Amendment to 19 TAC §30.21, Historically Underutilized Business (HUB) Program
- Official Agenda Item #16—Approval of the Selection of a Firm(s) to Provide Private Equity Specialist Advisor and/or Fund of Fund Manager for the Permanent School Fund and Authorization for Contract Execution by the Commissioner of Education

Dr. McLeroy reported that official agenda item #16 was being pulled from the consent agenda, per Mrs. Miller's request.

By unanimous consent, the State Board of Education approved the items on the consent agenda, including the three items that were brought forward.

(1) Approval of 2009-2013 Rule Review Plan for State Board of Education Rules
(Board agenda page I-21)
(COMMITTEE OF THE FULL BOARD)

The State Board of Education approved the proposed 2009-2013 Rule Review Plan for State Board of Education Rules, as recommended by the Committee of the Full Board.

(ATTACHMENT 3, page 17)

(2) Ratification of the Purchases and Sales of the Investment Portfolio of the Permanent School Fund for the Months of October and November 2008
(Board agenda page III-27)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education ratified the purchases and sales for the months of October and November 2008, in the amount of $1,716,475,800 and $1,220,483,113, respectively, as recommended by the Committee on School Finance/Permanent School Fund.

(3) Authorization to Issue a Request for Proposals for Global Custody and Securities Lending Services for the Permanent School Fund
(Board agenda page III-29)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education approved the recommendation of the Committee on School Finance/Permanent School Fund to postpone the issuance of a Request for Proposals for Global Custody and Securities Lending Services for the Permanent School Fund.

(4) Search for Outside Legal Counsel for the Permanent School Fund
(Board agenda page III-31)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education approved the recommendation of the Committee on School Finance/Permanent School Fund to postpone the search for outside legal counsel for the Permanent School Fund.

(5) Recommendation for Appointments to the Fort Sam Houston Independent School District Board of Trustees
(Board agenda page IV-1)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education approved the reappointments of Keith Toney, Deborah Seabron, and Eustace Lewis to each serve two-year terms of office, from January 23, 2009, through January 22, 201l, on the Fort Sam Houston Independent School District Board of Trustees, as recommended by the Committee on School Initiatives.

(ATTACHMENT 4, page 21)

5. Adoption of the Review of 19 TAC Chapter 30, Administration, Subchapter A, State Board of Education: General Provisions, and Proposed Amendment to 19 TAC §30.1, Petition for Adoption of Rule Changes
(Adoption of Review)
(First Reading and Filing Authorization of Amendment)
(Board agenda page I-15)
(COMMITTEE OF THE FULL BOARD)

The State Board of Education adopted the review of 19 TAC Chapter 30, Administration, Subchapter A, State Board of Education: General Provisions; and approved for first reading and filing authorization, the proposed amendment to 19 TAC §30.1, Petition for Adoption of Rule Changes, as amended and as recommended by the Committee of the Full Board.

13. Proposed Amendment to 19 TAC Chapter 129, Student Attendance, Subchapter B, Student Attendance Accounting, §129.21, Requirements for Student Attendance Accounting for State Funding Purposes
(First Reading and Filing Authorization)
(Board agenda page III-13)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education approved for first reading and filing authorization the proposed amendment to 19 TAC Chapter 129, Student Attendance, Subchapter B, Student Attendance Accounting, §129.21, Requirements for Student Attendance Accounting for State Funding Purposes, as recommended by the Committee on School Finance/Permanent School Fund.

14. Adoption of the Review of 19 TAC Chapter 30, Administration, Subchapter B, State Board of Education: Purchasing and Contracts, and Proposed Amendment to 19 TAC §30.21, Historically Underutilized Business (HUB) Program
(Adoption of Review)
(First Reading and Filing Authorization of Amendment)
(Board agenda page III-19)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education adopted the review of 19 TAC Chapter 30, Administration, Subchapter B, State Board of Education: Purchasing and Contracts, and approved for first reading and filing authorization the proposed amendment to 19 TAC §30.21, Historically Underutilized Business (HUB) Program, as recommended by the Committee on School Finance/Permanent School Fund.

COMMITTEE OF THE FULL BOARD

Dr. McLeroy reported on the Update on Texas Essential Knowledge and Skills, a discussion item of the Committee of the Full Board.

3. Legislative Recommendations for the 81st Texas Legislature
(Board agenda page I-1)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to adopt the State Board of Education's legislative recommendations to the 81st Texas Legislature.*

(ATTACHMENT 5, page 29)

4. Proposed Amendment to 19 TAC Chapter 101, Assessment, Subchapter B, Development and Administration of Tests, §101.23, Performance Standards
(Second Reading and Final Adoption)
(Board agenda page I-3)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to approve for second reading and final adoption the proposed amendment to 19 TAC Chapter 101, Assessment, Subchapter B, Development and Administration of Tests, §101.23, Performance Standards, with an effective date of September 1, 2009.*

(ATTACHMENT 6, page 31)

5. Adoption of the Review of 19 TAC Chapter 30, Administration, Subchapter A, State Board of Education: General Provisions, and Proposed Amendment to 19 TAC §30.1, Petition for Adoption of Rule Changes
(Adoption of Review)
(First Reading and Filing Authorization of Amendment)
(Board agenda page I-15)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

6. Proposed Amendments to 19 TAC Chapter 111, Texas Essential Knowledge and Skills for Mathematics, Subchapter B, Middle School, and Subchapter C, High School
(Second Reading and Final Adoption)
(Board agenda page I-29)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption the proposed amendments to 19 TAC Chapter 111, Texas Essential Knowledge and Skills for Mathematics, Subchapter B, Middle School, and Subchapter C, High School, with an effective date of 20 days after filing as adopted with the Texas Register. The motion carried, with 14 members voting Aye and 0 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Ms. Leo*
	Mrs. Berlanga	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Hardy	*Mr. Nuñez*

Mr. Bradley did not vote.

(ATTACHMENT 7, page 37)

7. Proposed Revisions to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School
(First Reading and Filing Authorization)
(Board agenda page I-51)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to approve for first reading and filing authorization the proposed revisions to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School, as amended.*

8. Midcycle 2010 Proclamation of the State Board of Education Advertising for Bids on Instructional Materials
(Board agenda page I-57)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to approve the Midcycle 2010 Proclamation of the State Board of Education Advertising for Bids on Instructional Materials. (Ms. Leo was absent for the vote.)*

(ATTACHMENT 8, page 53)

9. Recommendations Regarding Readoption of Instructional Materials
(Board agenda page I-59)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to readopt instructional materials currently under contract in the subject areas and for the periods indicated in the attachment. (Ms. Leo was absent for the vote.)*

(ATTACHMENT 9, page 55)

10. Consideration of Options for Graduation Credit for Athletics
(Board agenda page I-63)

MOTION AND VOTE: *It was moved by Mr. Craig, seconded by Mr. Mercer, and carried unanimously that the State Board of Education postpone action on the consideration of options for graduation credit for athletics until the March 2009 meeting of the State Board of Education. (Mr. Agosto and Mr. Bradley were absent for the vote.)*

11. Approval of Nominees to Recommend to the Governor for Service on the Board of Trustees of the Teacher Retirement System of Texas
(Board agenda page I-66a)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to approve the list of nominees to be submitted to the governor for consideration for appointment to the board of trustees of the Teacher Retirement System to fill an unexpired term ending on August 31, 2013. (Ms. Leo was absent for the vote.)*

(ATTACHMENT 10, page 63)

COMMITTEE ON INSTRUCTION (Mrs. Cargill, chair)

No action items.

COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND (Mr. Bradley, chair)

12. Proposed Amendment to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, §33.65, Guarantee Program for School District Bonds
(Second Reading and Final Adoption)
(Board agenda page III-1)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption the proposed amendment to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, §33.65, Guarantee Program for School District Bonds, as amended, with an effective date of 20 days after filing as adopted with the Texas Register. The motion carried, with 15 members voting Aye and 0 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Ms. Leo*
	Mrs. Berlanga	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mr. Craig	*Mrs. Miller*
	Ms. Dunbar	*Mr. Nuñez*
	Ms. Hardy	

(ATTACHMENT 11, page 75)

13. Proposed Amendment to 19 TAC Chapter 129, Student Attendance, Subchapter B, Student Attendance Accounting, §129.21, Requirements for Student Attendance Accounting for State Funding Purposes
(First Reading and Filing Authorization)
(Board agenda page III-13)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

14. Adoption of the Review of 19 TAC Chapter 30, Administration, Subchapter B, State Board of Education: Purchasing and Contracts, and Proposed Amendment to 19 TAC §30.21, Historically Underutilized Business (HUB) Program
(Adoption of Review)
(First Reading and Filing Authorization of Amendment)
(Board agenda page III-19)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

15. Decision on Private Equity Structure
(Board agenda page III-33)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education that the Permanent School Fund select a manager to implement a discretionary private equity fund-of-one separate account within constraints developed by the board.*

16. Approval of the Selection of a Firm(s) to Provide Private Equity Specialist Advisor and/or Fund of Funds Manager for the Permanent School Fund and Authorization for Contract Execution by the Commissioner of Education
(Board agenda page III-35)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education to terminate the current RFP for private equity specialist advisor and/or fund of funds manager, and to direct staff to develop a new RFP for discretionary private equity fund-of-one manager, for the Permanent School Fund.*

17. Approval of the Selection of a Firm to Provide Investment Counsel Services for the Permanent School Fund and Authorization for Contract Execution by the Commissioner of Education
(Board agenda page III-37)

MOTION: *It was recommended by the Committee on School Finance/Permanent School Fund to hire NEPC, LLC for investment counsel services for the Permanent School Fund and that the Commissioner of Education be authorized to execute such contract.*

MOTION AND VOTE: *It was moved by Mrs. Lowe and seconded by Mrs. Dunbar to postpone action on the RFP for investment counsel services for the Permanent School Fund until no later than the July meeting of the State Board of Education. The motion carried, with 12 members voting Aye and 3 members voting No, as follows:*

Aye:	*Mr. Allen*	*Mrs. Knight*
	Mr. Bradley	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	*Mrs. Miller*
No:	*Mr. Agosto*	*Mr. Nuñez*
	Mrs. Berlanga	

COMMITTEE ON SCHOOL INITIATIVES (Mr. Craig, chair)

18. Proposed Process for Awarding Open-Enrollment Charters to Remaining Generation 14 Applicants
(Board agenda page IV-47)

MOTION AND VOTE: *It was recommended by the Committee on School Initiatives and carried unanimously by the State Board of Education to adopt a process for awarding open-enrollment charter schools to remaining Generation 14 applicants as charters become available, as follows:*

If one or more charters become available for award at a State Board of Education (SBOE) meeting prior to September 1, 2009, it would offer each remaining Generation 14 applicant a chance to provide a 10-minute overview of the program to the Committee on School Initiatives. This will occur at the Committee on School Initiatives meeting the day before the SBOE may award available charters. If an additional charter or charters become available for award at a subsequent SBOE meeting, but prior to September 1, 2009, the remaining applicants will be expected to attend the Committee on School Initiatives meeting the day before the SBOE meeting when the committee members will discuss the applications, but there will be no additional presentations by the applicants. The committee members will deliberate and determine the recommendation for the board, and the board may take action the following day to award charters.

(Mrs. Berlanga was absent for the vote.)

REPORTS OF COMMITTEES REGARDING AGENDA ITEMS ON COMMITTEE AGENDAS

Committee on Instruction

Mrs. Cargill reported on the Review of 19 TAC Chapter 101, Assessment, a discussion item of the Committee on Instruction.

Committee on School Finance/Permanent School Fund

Mr. Bradley reported on the following discussion items of the Committee on School Finance/Permanent School Fund: Review of Permanent School Fund Securities Transactions and the Investment Portfolio; Annual Reporting Requirement of the Internally Managed Permanent School Fund Investment Portfolio; Discussion of the Madoff Financial Scandal; and Report of the Permanent School Fund Executive Administrator and Chief Investment Officer.

Committee on School Initiatives

No report was presented.

REPORTS OF STATE BOARD OF EDUCATION MEMBERS REGARDING AGENDA ITEMS AND EDUCATIONAL ACTIVITIES AND CONCERNS IN INDIVIDUAL DISTRICTS

Dr. McLeroy gave board members an opportunity to provide information regarding agenda items or other relevant information about public education.

The meeting adjourned at 11:45 a.m.

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Terri Leo, Secretary

English Language Arts

Minutes
State Board of Education
May 23, 2008

The State Board of Education met at 9:15 a.m. on Friday, May 23, 2008, in the State Board of Education Room, #1-104, of the William B. Travis Building, 1701 North Congress Avenue, Austin, Texas. All members of the board were present, as follows:

Don McLeroy, Chair; Rick Agosto, Secretary; Lawrence A. Allen, Jr.; Mary Helen Berlanga; David Bradley, Vice Chair; Barbara Cargill; Bob Craig; Cynthia Noland Dunbar; Pat Hardy; Mavis B. Knight; Terri Leo; Gail Lowe; Ken Mercer; Geraldine Miller; Rene Nuñez

Student Performance

The student performance was provided by the Martin Luther King, Jr. Learning Center Ballroom Dance Team, Dallas Independent School District, Dallas, Texas.

Invocation

Pledge of Allegiance

Approval of Minutes

State Board of Education, March 28, 2008

MOTION AND VOTE: *It was moved by Mr. Craig and carried unanimously to approve the Minutes of the March 28, 2008, meeting of the State Board of Education, as printed.*

Public Testimony

Individual testimony will be taken to address items other than those on the board agenda.

The State Board of Education received no presentations of public testimony.

1. Resolutions and Presentations

The official portrait of Shirley J. Neeley, former commissioner of education, was unveiled. The portrait now hangs in the boardroom of the William B. Travis Building.

2. Approval of Consent Agenda

Any agenda item may be placed on the consent agenda by any State Board of Education committee. The State Board of Education may elect to take separate action on any item on the consent agenda.

In addition to the items on the original consent agenda, the following agenda items received unanimous approval in committee and were brought forward to the consent agenda for board approval:

- Official Agenda Item #11--Review of 19 TAC Chapter 129, Student Attendance, Subchapter A, Student Attendance Allowed, and Subchapter B, Student Attendance Accounting

- Official Agenda Item #20--Adoption of Review of 19 TAC Chapter 100, Charters, Subchapter A, Open-Enrollment Charter Schools, and Subchapter B, Home-Rule School District Charters, and Proposed Amendments to 19 TAC §100.1, Application and Selection Procedures and Criteria, and §100.10l, Annual Report on Open-Enrollment Charter Governance

By unanimous consent, the State Board of Education approved the following items on the consent agenda, including the two items that were brought forward.

(1) Adoption of an Annual Report on the Status of the Bond Guarantee Program
(Board agenda page III-51)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education adopted an annual report on the status of the Bond Guarantee Program as of August 31, 2007, as recommended by the Committee on School Finance/Permanent School Fund.

(ATTACHMENT 1, page 27)

(2) Approval to Contract with Strasburger & Price, LLP and Authorization for Contract Execution by the Commissioner of Education
(Board agenda page III-79)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education approved a contract with Strasburger & Price, LLP, to provide fiduciary and transactional counsel services for the Permanent School Fund, and authorized contract execution by the commissioner of education, subject to approval by the Attorney General, as recommended by the Committee on School Finance/Permanent School Fund.

(3) Ratification of the Purchases and Sales of the Investment Portfolio of the Permanent School Fund for the Months of February and March 2008
(Board agenda page III-81)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education ratified the purchases and sales for the months of February and March 2008, in the amount of $1,671,978,039 and $1,564,491,888, respectively, as recommended by the Committee on School Finance/Permanent School Fund.

(11) Review of 19 TAC Chapter 129, Student Attendance, Subchapter A, Student Attendance Allowed, and Subchapter B, Student Attendance Accounting
(Adoption of Review)
(Board agenda page III-3)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education adopted the Review of 19 TAC Chapter 129, Student Attendance, Subchapter A, Student Attendance Allowed, and Subchapter B, Student Attendance Accounting, as recommended by the Committee on School Finance/ Permanent School Fund.

(20) Adoption of Review of 19 TAC Chapter 100, Charters, Subchapter A, Open-Enrollment Charter Schools, and Subchapter B, Home-Rule School District Charters, and Proposed Amendments to 19 TAC §100.1, Application and Selection Procedures and Criteria, and §100.101, Annual Report on Open-Enrollment Charter Governance
(Adoption of Review)
(First Reading and Filing Authorization)
(Board agenda page IV-45)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education adopted the review of 19 TAC Chapter 100, Charters, Subchapter A, Open-Enrollment Charter Schools, and Subchapter B, Home-Rule School District Charters, and approved for first reading and filing authorization the proposed amendments to 19 TAC §100.1, Application and Selection Procedures and Criteria, and §100.101, Annual Report on Open-Enrollment Charter Governance, as recommended by the Committee on School Initiatives.

The State Board of Education considered items in the following order: Committee of the Full Board, Committee on School Finance/Permanent School Fund, Committee on Instruction, and Committee on School Initiatives.

COMMITTEE OF THE FULL BOARD

3. Proposed Revisions to 19 TAC Chapter 110, Texas Essential Knowledge and Skills for English Language Arts and Reading, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School
(Second Reading and Final Adoption)
(Board agenda page I-1)

MOTION: *It was recommended by the Committee of the Full Board that the State Board of Education approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 110, Texas Essential Knowledge and Skills for English Language Arts and Reading, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School, that were approved in March 2008 and posted in the Texas Register for public comment, with all suggested changes developed by the facilitator, StandardsWork, as amended by the Committee of the Full Board.*

MOTION: *It was moved by Mr. Bradley and seconded by Mrs. Lowe that the State Board of Education adopt the substitute document for 19 TAC Chapter 110, Texas Essential Knowledge and Skills for English Language Arts and Reading, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School, and direct the commissioner of education to develop an appendix that includes 1) research-based reading comprehension strategies and effective ways to use them, and 2) a suggested author list that includes heritage as well as contemporary authors.*

MOTION AND VOTE: *It was moved by Mr. Allen and seconded by Mr. Nuñez that the State Board of Education go through the proposed substitute document line by line. The motion carried, with 9 members voting Aye and 6 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Mercer*
	Mrs. Berlanga	*Mrs. Miller*
	Mr. Craig	*Mr. Nuñez*
	Ms. Hardy	
No:	*Mr. Bradley*	*Mrs. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mrs. Dunbar	*Dr. McLeroy*

MOTION AND VOTE: *It was moved by Mrs. Cargill and seconded by Mrs. Miller that the State Board of Education only go through the proposed changes presented in the substitute document. The motion carried with 9 members voting Aye and 6 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mrs. Dunbar	*Mrs. Miller*
	Mrs. Leo	
No:	*Mr. Allen*	*Ms. Hardy*
	Mrs. Berlanga	*Mrs. Knight*
	Mr. Craig	*Mr. Nuñez*

The following reflects the proposed changes presented in the substitute document.

§110.11. Kindergarten

Reading/Beginning Reading Skills.
Standard title to include "Print Awareness." *No amendment.*

Reading/Beginning Reading Skills.
Standard title to include "Phonological Awareness." *No amendment.*

Reading/Beginning Reading Skills.
Standard title to include "Phonics." *No amendment.*

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Nuñez to amend the Reading/Beginning Reading Skills/Phonics standard, as follows:*

(A)-(B) (No change.)
(C) recognize that new words are created when letters are changed, added, or deleted; [~~and~~]
(D) create new words by putting two words together to make a compound word; and
(E) identify and read at least 15-25 high-frequency words from a commonly used list.

The motion failed, with 6 members voting Aye and 9 members voting No, as follows:

Aye:	*Mr. Allen*	*Ms. Hardy*
	Mrs. Berlanga	*Mrs. Knight*
	Mr. Craig	*Mr. Nuñez*
No:	*Mr. Agosto*	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mrs. Dunbar	*Mrs. Miller*
	Mrs. Leo	

Reading/Comprehension of Literary Text/Theme and Genre.
New student expectations, subparagraphs (A)-(D). *No amendment.*

Reading/Comprehension of Informational Text/Expository Text.
New student expectations, subparagraphs (A), (B), (D), and (E). *No amendment.* (**Note**: Subparagraph lettering to be corrected.)

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.12. Grade 1

Reading/Beginning Reading Skills.
Standard title to include "Print Awareness." *No amendment.*

Reading/Beginning Reading Skills.
Standard title to include "Phonological Awareness." *No amendment.*

Reading/Beginning Reading Skills.
Standard title to include "Phonics." *No amendment.*

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectations, subparagraphs (A)-(E). *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.13. Grade 2

Reading/Beginning Reading Skills.
Standard title to include "Print Awareness." *No amendment.*

Reading/Beginning Reading Skills.
Standard title to include "Phonics." *No amendment.*

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mrs. Knight to amend the Reading/Beginning Reading Skills/Phonics standard, as follows:*

(A)-(F) (No change.)
(G) identify and read at least 300 high-frequency words from a commonly used list; [~~and~~]
(H) monitor accuracy of reading using decoding, syntax, semantics, and visual information; and [~~monitor accuracy of decoding.~~].
(I) alphabetize a series of words and locate the words in a beginner's dictionary.

The motion failed.

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectations, subparagraphs (A)-(F). *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.14. Grade 3

Reading/Beginning Reading Skills.
Standard title to include "Phonics." *No amendment.*

Reading/Media Literacy.

MOTION AND VOTE: *It was moved by Mrs. Lowe, seconded by Mrs. Cargill, and carried unanimously to amend the Reading/Media Literacy standard, using language from the corresponding Reading/Media Literacy standard in the comparison chart (side by side), as follows:*

(A) understand how communication changes when moving from one genre of media to another;
(B) explain how various design techniques used in media influence the message (e.g., shape, color, sound); and
(C) compare various written conventions used for digital media (e.g., language in an informal e-mail vs. language in a web-based news article).

[~~(A) recognize different purposes of media (e.g., informational, entertainment);~~
~~(B) describe techniques used to create media messages (e.g., sound, graphics); and~~
~~(C) identify various written conventions for using digital media (e.g., e-mail, website, video game).~~]

(Mr. Nuñez was absent for the vote.)

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectations, subparagraphs (A)-(G). *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.15. Grade 4

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.16. Grade 5

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectations, subparagraphs (A)-(E). *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.18. Grade 6

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.19. Grade 7

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.20. Grade 8

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Nuñez to amend the Oral and Written Conventions/Handwriting, Capitalization, and Punctuation standard, using language from the Writing/Conventions of Language/Handwriting standard in the comparison chart (side by side), as follows:*

Writing/Conventions of Language/Handwriting. [~~Oral and Written Conventions/ Handwriting, Capitalization, and Punctuation.~~] Students write legibly and use appropriate capitalization and punctuation conventions in their compositions. Students will continue to apply earlier standards with greater complexity. The student is [~~Students are~~] expected to:

(A) use conventions of capitalization; and
(B) use correct punctuations marks, including:
(i) commas after introductory structures and dependent adverbial clauses, and correctly punctuate complex sentences [~~words, phrases and clauses~~]; and
(ii) semicolons, colons, hyphens, parentheses, brackets, and ellipses [~~and hyphens~~].

The motion carried. (Mr. Agosto and Mr. Bradley were absent for the vote.)

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.31. English I

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.32. English II

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(C). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.33. English III

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectation. *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

§110.34. English IV

Reading/Media Literacy.
New standard and accompanying student expectations, subparagraphs (A)-(D). *No amendment.*

Oral and Written Conventions/Conventions.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Oral and Written Conventions/Handwriting, Capitalization, and Punctuation.
Moved standard and accompanying student expectation. *No amendment.*

Oral and Written Conventions/Spelling.
Moved standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Listening.
New standard and accompanying student expectations, subparagraphs (A)-(B). *No amendment.*

Listening and Speaking/Speaking.
New standard and accompanying student expectation. *No amendment.*

Listening and Speaking/Teamwork.
New standard and accompanying student expectation. *No amendment.*

MOTION AND VOTE: *It was moved by Mrs. Dunbar and seconded by Mrs. Leo to amend §§110.10, 110.17, and 110.30, as follows:*

§110.10. Implementation of Texas Essential Knowledge and Skills for English Language Arts and Reading, Elementary, Beginning with School Year 2009-2010.

(a) The provisions of §§110.11-110.16 of this subchapter shall be implemented by school districts beginning with the 2009-2010 school year and at that time shall supersede §§110.2-110.7 of this subchapter.

(b) Students must develop the ability to comprehend and process material from a wide range of texts. Student expectations for Reading/Comprehension Skills as provided in the subsection are described for the appropriate grade level.

Figure: 19 TAC §110.10(b)

§110.17. Implementation of Texas Essential Knowledge and Skills for English Language Arts and Reading, Middle School, Beginning with School Year 2009-2010.

(a) The provisions of §§110.18-110.20 of this subchapter shall be implemented by school districts beginning with the 2009-2010 school year and at that time shall supersede §§110.22-110.24 of this subchapter.

(b) Students must develop the ability to comprehend and process material from a wide range of texts. Student expectations for Reading/Comprehension Skills as provided in the subsection are described for the appropriate grade level.

Figure: 19 TAC §110.17(b)

§110.30. Implementation of Texas Essential Knowledge and Skills for English Language Arts and Reading, High School, Beginning with School Year 2009-2010.

(a) The provisions of §§110.31-110.34 of this subchapter shall be implemented by school districts beginning with the 2009-2010 school year and at that time shall supersede §§110.42-110.45 of this subchapter.

(b) Students must develop the ability to comprehend and process material from a wide range of texts. Student expectations for Reading/Comprehension Skills as provided in the subsection are described for the appropriate grade level.

Figure: 19 TAC §110.30(b)

The motion carried, with 9 members voting Aye and 6 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mrs. Dunbar	*Mrs. Miller*
	Mrs. Leo	
No:	*Mr. Allen*	*Ms. Hardy*
	Mrs. Berlanga	*Mrs. Knight*
	Mr. Craig	*Mr. Nuñez*

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Ms. Hardy to take the reading comprehension section that is now an appendix and incorporate it in the main body of the document and carry through each grade level. The motion failed, with 6 members voting Aye and 9 members voting No, as follows:*

Aye:	*Mr. Allen*	*Ms. Hardy*
	Mrs. Berlanga	*Mrs. Knight*
	Mr. Craig	*Mr. Nuñez*
No:	*Mr. Agosto*	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mrs. Dunbar	*Mrs. Miller*
	Mrs. Leo	

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Nuñez to divide the issue as to the author list which is an appendix on the motion for a separate vote. The motion failed, with 7 members voting Aye and 8 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mr. Nuñez*
	Mr. Craig	
No:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mrs. Dunbar	*Mr. Mercer*
	Mrs. Leo	*Mrs. Miller*

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Ms. Hardy to strike the author list and direct the commissioner of education to provide reading resources websites. The motion carried, with 8 members voting Aye and 7 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Dr. McLeroy*
	Mr. Craig	*Mr. Nuñez*
No:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Mr. Mercer*
	Mrs. Dunbar	*Mrs. Miller*
	Mrs. Leo	

MOTION AND VOTE: *It was moved by Mrs. Lowe and carried unanimously that the State Board of Education approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 110, Texas Essential Knowledge and Skills for English Language Arts and Reading, Subchapter B, Middle School, §110.25, English Language Arts and Reading, Reading (Elective Credit), and §110.26, English Language Arts and Reading, Speech (Elective Credit). (Ms. Hardy was absent for the vote.)*

(ATTACHMENT 2, page 37)

VOTE: *A vote was taken on, "Shall the document, as amended today, be substituted for the document recommended by the Committee of the Full Board yesterday." The motion carried, with 9 members voting Aye and 6 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mrs. Dunbar	*Mrs. Miller*
	Mrs. Leo	
No:	*Mr. Allen*	*Ms. Hardy*
	Mrs. Berlanga	*Mrs. Knight*
	Mr. Craig	*Mr. Nuñez*

VOTE: *A vote was taken to adopt for second reading and final adoption substitute 19 TAC Chapter 110, Texas Essential Knowledge and Skills for English Language Arts and Reading, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School, as amended. The motion carried, with 9 members voting Aye and 6 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mrs. Dunbar	*Mrs. Miller*
	Mrs. Leo	
No:	*Mr. Allen*	*Ms. Hardy*
	Mrs. Berlanga	*Mrs. Knight*
	Mr. Craig	*Mr. Nuñez*

David Anderson, legal counsel, informed the State Board of Education that technical corrections would need to be made prior to filing the adopted rule text with the *Texas Register*, as authorized in the board's operating rules. Mr. Bradley asked Mr. Anderson to check for grammar as well.

(ATTACHMENT 3, page 43)

4. Proposed Amendments to Proclamation 2010
(Board agenda page I-89)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education, to approve the proposed amendments to Proclamation 2010. (Mrs. Berlanga, Ms. Hardy, and Mr. Nuñez were absent for the vote.)*

At the request of Mrs. Leo and without objection from the board, this item was brought back for reconsideration.

MOTION AND VOTE: *It was moved by Mrs. Leo, seconded by Mrs. Lowe, and carried unanimously to amend the proposed amendments to Proclamation 2010, as follows:*

> *In determining percent decodability for each 1st grade program, all opportunities to read text throughout that program shall be included. Publishers of 1st grade programs shall document, in matrix format, five opportunities to decode phonetically regular words containing each of the 70 letter-sound correspondences, after all letter-sound correspondences in those words have been taught. For each letter-sound correspondence that a 1st grade program teaches in addition to this minimum of 70, the publisher shall likewise document, in matrix format, five opportunities to decode phonetically-regular words containing that letter-sound correspondence, after all letter-sound correspondence in those words have been taught.*

(Mrs. Berlanga, Ms. Hardy, and Mr. Nuñez were absent for the vote.)

5. Proclamation 2011 of the State Board of Education
Advertising for Bids on Instructional Materials
(Board agenda page I-91)

MOTION AND VOTE: *It was moved by Mrs. Miller, seconded by Mrs. Lowe, and carried unanimously that the State Board of Education approve Proclamation 2011 of the State Board of Education Advertising for Bids on Instructional Materials, and reinstate the original proposal given to the Committee of the Full Board that includes consumables for Grades 1-2 Spelling, and Grades 1-3 Handwriting. (Mrs. Berlanga and Mr. Nuñez were absent for the vote.)*

(ATTACHMENT 4, page 143)

COMMITTEE ON INSTRUCTION (Mrs. Leo, Chair)

6. Proposed New 19 TAC Chapter 74, Curriculum Requirements, Subchapter C, Other Provisions, §74.36, Requirements for Elective Courses on the Bible's Hebrew Scriptures (Old Testament) and New Testament and Their Impact on the History and Literature of Western Civilization
(Second Reading and Final Adoption)
(Board agenda page II-1)

MOTION AND VOTE: *It was recommended by the Committee on Instruction and carried unanimously by the State Board of Education, to postpone action on proposed new 19 TAC Chapter 74, Curriculum Requirements, Subchapter C, Other Provisions, §74.36, Requirements for Elective Courses on the Bible's Hebrew Scriptures (Old Testament) and New Testament and Their Impact on the History and Literature of Western Civilization, for second reading and final adoption, pending a response from the Attorney General's office. (Mr. Agosto, Mrs. Berlanga, Mr. Bradley, Mr. Craig, Mrs. Dunbar, Ms. Hardy, and Mr. Nuñez were absent for the vote.)*

7. Requests to Approve Substitution of Instructional Materials
(Board agenda page II-11)

MOTION AND VOTE: *It was recommended by the Committee on Instruction and carried unanimously by the State Board of Education, to approve the request from:*

Perfection Learning Corporation to substitute a newer version of 38 Basic Speech Experiences instructional materials; Bedford, Freeman & Worth Publishing to substitute a newer version of Chemistry in the Community and Physics for Scientists and Engineers; and Scholastic Inc. to substitute a newer version of Scholastic Spelling, Texas Teacher's Editions, Grades 1 and 2. (Mr. Agosto, Mrs. Berlanga, Mr. Bradley, Mr. Craig, Mrs. Dunbar, and Mr. Nuñez were absent for the vote.)

8. Proposed Approval of Innovative Courses
(Board agenda page II-17)

MOTION AND VOTE: *It was recommended by the Committee on Instruction and carried unanimously by the State Board of Education, to approve the innovative course that does not fall within any of the subject areas of the foundation or enrichment curriculum as shown in Attachment III of the agenda. (Mr. Agosto, Mrs. Berlanga, Mr. Bradley, Mr. Craig, Mrs. Dunbar, and Mr. Nuñez were absent for the vote.)*

(ATTACHMENT 5, page 145)

9. Proposed Amendment to 19 TAC Chapter 74, Curriculum Requirements, Subchapter C, Other Provisions, §74.30, Identification of Advanced Courses
(Second Reading and Final Adoption)
(Board agenda page II-23)

MOTION AND VOTE: *It was recommended by the Committee on Instruction and carried by an affirmative vote of two-thirds of the members of the board, to approve for second reading and final adoption the proposed amendment to 19 TAC Chapter 74, Curriculum Requirements, Subchapter C, Other Provisions, §74.30, Identification of Advanced Courses, with an effective date of 20 days after filing as adopted with the Texas Register. (Mrs. Berlanga and Mr. Nuñez were absent for the vote.)*

(ATTACHMENT 6, page 147)

COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND (Due to Mr. Nunez's absence during this portion of the meeting, Ms. Hardy, vice chair, provided this report.)

10. Review of Options to Coordinate Real Estate Investment with the General Land Office
(Board agenda page III-1)

Refer to agenda item #13.

11. Review of 19 TAC Chapter 129, Student Attendance, Subchapter A, Student Attendance Allowed, and Subchapter B, Student Attendance Accounting
(Adoption of Review)
(Board agenda page III-3)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

12. Proposed Amendments to 19 TAC Chapter 109, Budgeting, Accounting, and Auditing, Subchapter D, Uniform Bank Bid and Depository Contract
(First Reading and Filing Authorization)
(Board agenda page III-11)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education, to approve for first reading and filing authorization the proposed amendments to 19 TAC Chapter 109, Budgeting, Accounting, and Auditing, Subchapter D, Uniform Bank Bid and Depository Contract, and Surety Bond Forms. (Mrs. Berlanga, Mrs. Cargill, and Mr. Nuñez were absent for the vote.)*

13. Approval of the Selection of a Firm to Provide Real Estate Investment Counsel Services for the Permanent School Fund and Authorization for Contract Execution by the Commissioner of Education
(Board agenda page III-63)

MOTION: *It was moved by Mr. Agosto and seconded by Mrs. Dunbar that the State Board of Education hire Courtland Partners, Ltd. as real estate advisor under structure #4 as provided by staff to provide the expertise and advice related to the Permanent School Fund investment strategy of the real estate portfolio for the Permanent School Fund.*

Ms. Hardy offered a friendly amendment that staff be directed to negotiate fees.

VOTE: *A vote was taken on the motion that the State Board of Education hire Courtland Partners, Ltd. as real estate advisor under structure #4 as provided by staff to provide the expertise and advice related to the Permanent School Fund investment strategy of the real estate portfolio for the Permanent School Fund, and that the staff be directed to negotiate fees. The motion carried, with 9 members voting Aye and 4 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Leo*
	Mr. Allen	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mrs. Dunbar	
No:	*Mr. Craig*	*Mrs. Knight*
	Mr. Hardy	*Mrs. Miller*

(Mrs. Berlanga and Mr. Nuñez were absent for the vote.)

(ATTACHMENT 7, page 149)

14. Authorization to Issue a Request for Proposals for Private Equity Specialist Advisor and/or Fund of Funds Manager
(Board agenda page III-65)

MOTION: *It was recommended by the Committee on School Finance/Permanent School Fund that the State Board of Education approve the issuance of a Request for Proposals for Private Equity Specialist Advisor and/or Fund of Funds Manager for the Permanent School Fund.*

MOTION: *It was moved by Mr. Agosto and seconded by Dr. McLeroy to amend the Request for Proposals for Private Equity Specialist Advisor and/or Fund-of-Funds Manager for the Permanent School Fund, as follows:*

1.3 MINIMUM QUALIFICATIONS OF THE PROPOSER

The SBOE [~~and/or TEA~~] will select the firm whose proposal demonstrates, in its judgment, the competence and experience to provide the best overall results and service. The firm selected must meet requirements established by State Law, the TEA, the SBOE, the State Comptroller, and the State Auditor.

Minimum qualifications for lead investment professionals: The biographies of the lead investment professionals assigned to the TPSF account must:

a. – c. (No change.)

Minimum qualifications for firms: All firms submitting proposals for the mandate stated above, must at a minimum:

d. – f. (No change.)

g. have significant private equity assets under advisement (AUA), non-discretionary and/or discretionary, and of the AUA, no less than ($3) billion [~~($800) million~~], and prefer ($5) five [~~($1) one~~] billion or greater in capital commitments to private equity investments;

h. exhibit a history of at least three (3) [~~five (5)~~] consecutive years experience building multiple, well-diversified private equity programs.

Ms. Hardy chaired the meeting for this portion of the meeting.

MOTION AND VOTE: *It was moved by Dr. McLeroy and seconded by Mr. Craig to amend Mr. Agosto's motion, as follows:*

g. have significant private equity assets under advisement (AUA), non-discretionary and/or discretionary, and of the AUA, no less than ($1.5) billion [~~($3) billion~~], and prefer ($2.5) two and one-half [~~($5) five~~] billion or greater in capital commitments to private equity investments;

The motion carried, with Mrs. Knight and Mrs. Miller voting No. (Mrs. Berlanga, Mr. Bradley, Mrs. Dunbar, Mrs. Leo, and Mr. Nuñez were absent for the vote.)

VOTE: *A vote was taken on Mr. Agosto's motion, as amended by Dr. McLeroy. The motion carried, with 8 members voting Aye and 3 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Dunbar*
	Mr. Allen	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mrs. Mercer*
No:	*Ms. Hardy*	*Mrs. Miller*
	Mrs. Knight	

(Mrs. Berlanga, Mr. Bradley, Mrs. Leo, and Mr. Nuñez were absent for the vote.)

VOTE: *A vote was taken on the motion that the State Board of Education approve the issuance of a Request for Proposals for Private Equity Specialist Advisor and/or Fund of Funds Manager for the Permanent School Fund, as amended. The motion carried. (Mrs. Berlanga, Mr. Bradley, Mrs. Leo, and Mr. Nuñez were absent for the vote.)*

MOTION: *It was moved by Mrs. Knight and seconded by Mr. Craig to add at the end of the last sentence in section 1.3, Minimum Qualifications of the Proposer, the language that TEA would vet the applicants prior to the SBOE selection process.*

Mrs. Knight withdrew her motion, without objection.

15. Proposed Amendment to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, §33.5, Code of Ethics
(First Reading and Filing Authorization)
(Board agenda page III-67)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried by the State Board of Education, with Mrs. Miller voting No, to approve for first reading and filing authorization the revised proposed amendment to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, §33.5, Code of Ethics, as amended by the Committee on School Finance/Permanent School Fund. (Mrs. Berlanga, Mr. Bradley, and Mr. Nuñez were absent for the vote.)*

16. Directive Relating to the Goldman Sachs Absolute Return Contract
(Board agenda page III-83)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education to waive the conflicts of interest disclosed in RFP #701-08-003, Absolute Return-Separate Account Fund of Funds for the Texas Permanent School Fund, and direct David Anderson, general counsel, to draft a motion, which is detailed below.*

I move that the Board, acting pursuant to Section 33.5(g)(4) of the PSF Code of Ethics, waive the conflicts of interest disclosed by

Grosvenor Capital Management L.P.
Mesirow Advanced Strategies, Inc.
K2/D&S Management Co., L.L.C.
Blackstone Alternative Asset Management L.P.
Goldman Sachs Hedge Fund Strategies, L.L.C.

in RFP #701-08-003 Absolute Return – Separate Account Fund of Funds for the Texas Permanent School Fund and direct staff to continue to negotiate and enter into contracts as directed at the November 16, 2007, Board meeting. (Mrs. Berlanga, Mr. Bradley, and Mr. Nuñez were absent for the vote.)

COMMITTEE ON SCHOOL INITIATIVES (Mr. Mercer, vice chair, provided this report.)

17. Review of Proposed Revisions to 19 TAC Chapter 232, General Certification Provisions
(Board agenda page IV-1)

MOTION AND VOTE: *It was recommended by the Committee on School Initiatives and carried unanimously by the State Board of Education to take no action on the review of proposed revisions to 19 TAC Chapter 232, General Certification Provisions, except to postpone the review of the proposed amendments to 19 TAC §232.4, Probationary Certificates, and §232.5, Temporary Teacher Certificates, until the July 2008 State Board of Education meeting. (Mrs. Berlanga, Mr. Bradley, Mr. Craig, Mrs. Dunbar, Mrs. Miller, and Mr. Nuñez were absent for the vote.)*

18. Review of Proposed Amendments to 19 TAC Chapter 233, Categories of Classroom Teaching Certificates
(Board agenda page IV-21)

MOTION AND VOTE: *It was recommended by the Committee on School Initiatives and carried unanimously by the State Board of Education to take no action on the review of proposed amendments to 19 TAC Chapter 233, Categories of Classroom Teaching Certificates. (Mrs. Berlanga, Mr. Bradley, Mr. Craig, Mrs. Dunbar, Mrs. Miller, and Mr. Nuñez were absent for the vote.)*

19. Creation of Employers for Education Excellence Award
(Board agenda page IV-33)

MOTION AND VOTE: *It was recommended by the Committee on School Initiatives and carried unanimously by the State Board of Education to approve the Employers for Education Excellence Award program, as authorized by Texas Education Code (TEC), §7.113. (Mr. Allen, Mrs. Berlanga, Mr. Bradley, Mr. Craig, Mrs. Dunbar, Mrs. Miller, and Mr. Nuñez were absent for the vote.)*

20. Adoption of Review of 19 TAC Chapter 100, Charters, Subchapter A, Open-Enrollment Charter Schools, and Subchapter B, Home-Rule School District Charters, and Proposed Amendments to 19 TAC §100.1, Application and Selection Procedures and Criteria, and §100.101, Annual Report on Open-Enrollment Charter Governance
(Adoption of Review)
(First Reading and Filing Authorization)
(Board agenda page IV-45)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

REPORT OF COMMITTEES

Committee on Instruction

Mrs. Leo reported on the following discussion items of the Committee on Instruction: Discussion of Proposed Amendment to 19 TAC Chapter 74, Curriculum Requirements, Subchapter F, Graduation Requirements, Beginning with School Year 2007-2008, §74.61, High School Graduation Requirements; and Discussion of Frequently Asked Questions Regarding 4x4 Requirements.

Committee on School Finance/Permanent School Fund

No report was presented.

Committee on School Initiatives

Mr. Mercer reported on the following discussion items of the Committee on School Initiatives: Discussion of Ongoing State Board for Educator Certification Activities; and Update on Approved Open-Enrollment Charter Schools.

REPORT OF THE COMMISSIONER OF EDUCATION

Commissioner of Education Robert Scott did not present a formal report.

REPORT OF THE CHAIR OF THE BOARD

Dr. McLeroy did not present a formal report.

REPORTS OF OTHER STATE BOARD OF EDUCATION MEMBERS

Dr. McLeroy gave board members an opportunity to provide comments.

The meeting adjourned at 3:49 p.m.

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Rick Agosto, Secretary

Science

Minutes
State Board of Education
March 27, 2009

The State Board of Education met at 9:03 a.m. on Friday, March 27, 2009, in the State Board of Education Room, #1-104, of the William B. Travis Building, 1701 N. Congress Avenue, Austin, Texas. All members of the board were present, as follows:

Presiding: Don McLeroy, Chair; Rick Agosto; Lawrence A. Allen, Jr., Vice Chair; David Bradley; Barbara Cargill; Bob Craig; Cynthia Dunbar; Pat Hardy; Terri Leo, Secretary; Gail Lowe; Ken Mercer; Geraldine Miller; Rene Nuñez

Mary Helen Berlanga participated in the meeting through videoconferencing capabilities at Region 2 Education Service Center, 209 North Water Street, Room 305, Corpus Christi, Texas.

Mavis B. Knight participated in the meeting through videoconferencing capabilities at Region 10 Education Service Center, TETN Kaufman Room, 400 East Spring Valley Road, Richardson, Texas.

Student Performance

The student performance was provided by the James Bowie High School Jazz Choir, Austin Independent School District. Mr. Mercer presented the choir with a special recognition certificate in appreciation of its outstanding performance.

Invocation

Pledge of Allegiance

Approval of Minutes

State Board of Education, January 13, 2009
State Board of Education, January 21, 2009
State Board of Education, January 23, 2009

MOTION AND VOTE: *It was moved by Mr. Craig and carried unanimously to approve the Minutes of the January 13, 2009, January 21, 2009, and January 23, 2009, meetings of the State Board of Education, as printed.*

Public Testimony

Individual testimony will be taken to address items other than those on the board agenda.

The State Board of Education received no presentations of public testimony.

1. Resolutions and Presentations

There were no resolutions or presentations introduced.

2. Approval of Consent Agenda

Any agenda item may be placed on the consent agenda by any State Board of Education committee. The State Board of Education may elect to take separate action on any item on the consent agenda.

In addition to the items on the original consent agenda, the following agenda items received unanimous approval in committee and were brought forward to the consent agenda for board approval:

- Official Agenda Item #7—Adoption of Review of 19 TAC Chapter 101, Assessment
- Official Agenda Item #8—Requests to Approve Substitutions of Instructional Materials
- Official Agenda Item #11—Proposed Ratification of Increase in the Reserve for the Guarantee Program for School District Bonds
- Official Agenda Item #13—Decision on a Real Estate Policy Statement
- Official Agenda Item #14—Authorization to Issue a Request for Proposals for Global Custody and Securities Lending Services for the Permanent School Fund
- Official Agenda Item #15—Authorization to Issue a Request for Proposals for a Private Equity Discretionary Separate Account Manager
- Official Agenda Item #16—Authorization to Issue a Request for Proposals for Performance Measurement Services for the Permanent School Fund

Dr. McLeroy reported that official agenda items #11, #13, #14, #15, and #16 were being pulled from the consent agenda, per the request of some board members.

By unanimous consent, the State Board of Education approved the following items on the consent agenda, including the two items that were brought forward.

(1) Ratification of the Purchases and Sales of the Investment Portfolio of the Permanent School Fund for the Months of December 2008 and January 2009
(Board agenda page III-17)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education ratified the purchases and sales for the months of December 2008 and January 2009, in the amount of $667,387,330 and $658,796,495, respectively, as recommended by the Committee on School Finance/Permanent School Fund.

(2) Recommendation for Appointment to the Lackland Independent School District Board of Trustees
(Board agenda page IV-1)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education approved the appointment of MSgt Elizabeth Morales to serve a two-year term of office from March 27, 2009, through March 26, 201l, on the Lackland Independent School District Board of Trustees, as recommended by the Committee on School Initiatives.

(ATTACHMENT 1, page 19)

7. Adoption of Review of 19 TAC Chapter 101, Assessment
(Adoption of Review)
(Board agenda page II-1)
(COMMITTEE ON INSTRUCTION)

The State Board of Education adopted the review of 19 TAC Chapter 101, Assessment, as recommended by the Committee on Instruction.

8. Requests to Approve Substitutions of Instructional Materials
(Board agenda page II-43)
(COMMITTEE ON INSTRUCTION)

The State Board of Education approved the request from SRA McGraw-Hill to substitute newer versions of two components of *The DLM Early Childhood Express Texas Package* instructional materials, and approved the request from Bedford, Freeman & Worth Publishing to substitute newer versions of *Psychology* and *The Making of the West*, as recommended by the Committee on Instruction.

COMMITTEE OF THE FULL BOARD

John Lopez, managing director of instructional materials and educational technology, reviewed the Discussion of Proclamation 2012 Regarding Science Instructional Materials; and Anita Givens, associate commissioner for standards and programs, reviewed the Discussion of Texas High School Graduation Programs. These items were postponed during the meeting of the Committee of the Full Board the previous day, to be considered at this general board meeting.

3. Proposed Revisions to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School
(Second Reading and Final Adoption)
(Board agenda page I-1)

MOTION: *It was recommended by the Committee of the Full Board that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School, as amended, with an effective date of 20 days after filing as adopted with the Texas Register.*

MOTION: *It was moved by Ms. Dunbar and seconded by Dr. McLeroy to amend subsection (b)(3)(A) in §112.14. Science, Grade 3; §112.15. Science, Grade 4; §112.16. Science, Grade 5; §112.18. Science, Grade 6; §112.19. Science, Grade 7; §112.20. Science, Grade 8; and subsection (c)(3)(A) in §112.32. Aquatic Science; §112.33. Astronomy; §112.34. Biology; §112.35. Chemistry; §112.36. Earth and Space Science; §112.37. Environmental Systems; §112.38. Integrated Physics and Chemistry; and §112.39. Physics, by substituting the following language:*

analyze, evaluate, and critique scientific explanations in all fields of science by using empirical evidence, logical reasoning and experimental and observational testing, by examining both scientific evidence that is supportive and not supportive of those explanations, so as to encourage critical thinking by the student;

MOTION: *It was moved by Mr. Craig and seconded by Ms. Dunbar to amend Ms. Dunbar's amendment, as follows:*

analyze, evaluate, and critique scientific explanations in all fields of science by using empirical evidence, logical reasoning, and experimental and observational testing, including [~~by~~] examining all sides of [~~both~~] scientific evidence [~~that is supportive and not supportive~~] of those scientific explanations, so as to encourage critical thinking by the student;

MOTION AND VOTE: *It was moved by Mrs. Cargill and seconded by Ms. Dunbar to amend Mr. Craig's motion by moving the phrase, "in all fields of science," to the beginning of the student expectation.*

The motion carried, with 11 members voting Aye and 4 members voting No, as follows:

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	*Mrs. Miller*
	Mrs. Knight	
No:	*Mr. Agosto*	*Mrs. Berlanga*
	Mr. Allen	*Mr. Nuñez*

VOTE: *A vote was taken on Mr. Craig's motion, as amended. The motion carried, with Mrs. Berlanga voting no.*

VOTE: *A vote was taken on the motion to amend subsection (b)(3)(A) in §112.14. Science, Grade 3; §112.15. Science, Grade 4; §112.16. Science, Grade 5; §112.18. Science, Grade 6; §112.19. Science, Grade 7; §112.20. Science, Grade 8; and subsection (c)(3)(A) in §112.32. Aquatic Science; §112.33. Astronomy; §112.34. Biology; §112.35. Chemistry; §112.36. Earth and Space Science; §112.37. Environmental Systems; §112.38. Integrated Physics and Chemistry; and §112.39. Physics, as amended, as follows:*

in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;

The motion carried, with 13 members voting Aye and 2 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Ms. Leo*
	Mr. Bradley	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Hardy	
No:	*Mrs. Berlanga*	*Mr. Nuñez*

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Ms. Hardy to amend §112.15. Science, Grade 4, subsection (a)(4)(A), by substituting the following language:*

Within the physical environment, students learn to measure physical properties of matter and to compare and contrast a variety of mixtures and solutions. The students explore different forms of energy. The students will design an experiment to test the effect of force on objects.

The motion failed, with 5 members voting Aye, 7 members voting No, and 3 members Abstaining, as follows:

Aye:	*Mr. Allen*	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Miller*
	Ms. Hardy	
No:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Nuñez*
	Ms. Leo	
Abstain:	*Mr. Agosto*	*Mr. Mercer*
	Mr. Craig	

MOTION AND VOTE: *It was moved by Mrs. Cargill, seconded by Ms. Dunbar, and carried to amend §112.18. Science, Grade 6, subsection (b)(5)(D), as follows:*

identify the formation of a new substance [~~compounds~~] by using the evidence of a possible chemical change such as production of a gas, change in temperature, production of a precipitate, or color change.

Mrs. Berlanga voted No.

MOTION AND VOTE: *It was moved by Mrs. Cargill, seconded by Ms. Leo, and carried to amend §112.18. Science, Grade 6, subsection (b)(8)(B), as follows:*

identify and describe the changes in position, direction, [~~motion,~~] and speed of an object when acted upon by unbalanced forces;

Mrs. Berlanga voted no.

MOTION AND VOTE: *It was moved by Mr. Mercer, seconded by Ms. Leo, and carried to amend §112.18. Science, Grade 6, subsection (b)(2)(A), as follows:*

plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;

Mrs. Berlanga voted no.

MOTION AND VOTE: *It was moved by Mrs. Cargill to amend §112.19. Science, Grade 7, subsection (b)(7)(B), as follows:*

illustrate the transformation of energy within an organism such as the transfer from chemical energy to heat and thermal energy in digestion [~~relate the amount of work done during an everyday activity to energy transformations~~]; and

The motion carried, with 11 members voting Aye and 4 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Leo*
	Mr. Allen	*Dr. McLeroy*
	Mr. Bradley	*Mr. Mercer*
	Mrs. Cargill	*Mrs. Miller*
	Ms. Dunbar	*Mr. Nuñez*
	Ms. Hardy	
No:	*Mrs. Berlanga*	*Mrs. Knight*
	Mr. Craig	*Mrs. Lowe*

MOTION AND VOTE: *It was moved by Mrs. Cargill, seconded by Mr. Craig, and carried to amend §112.19. Science, Grade 7, subsection (b)(12)(A), as follows:*

investigate and explain how internal structures of organisms have adaptations that allow [~~are adapted to perform~~] specific functions such as gills in fish, hollow bones in birds, or xylem in plants;

Mrs. Berlanga and Mrs. Knight voted No.

MOTION AND VOTE: *It was moved by Mr. Mercer, seconded by Mr. Craig, and carried to amend §112.19. Science, Grade 7, subsection (b)(2)(A), as follows:*

plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;

Mrs. Berlanga voted no.

MOTION AND VOTE: *It was moved by Mrs. Cargill and carried to amend §112.20. Science, Grade 8, subsection (b)(7)(C), as follows:*

relate the position of the moon and sun to their [~~lunar cycle to its~~] effect on ocean tides.

Mrs. Berlanga and Mrs. Knight voted No.

MOTION AND VOTE: *It was moved by Mr. Mercer, seconded by Mr. Craig, and carried to amend §112.20. Science, Grade 8, subsection (b)(2)(A), as follows:*

plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;

Mrs. Berlanga and Mrs. Knight voted no.

MOTION AND VOTE: *It was moved by Mr. Mercer, seconded by Mr. Craig, and carried to amend §112.20. Science, Grade 8, subsection (b)(2)(B), as follows:*

design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;

Mrs. Berlanga and Mrs. Knight voted no.

MOTION AND VOTE: *It was moved by Mr. Allen and seconded by Mr. Craig to strike §112.34. Biology, subsection (c)(7)(B), as follows:*

~~*(B) analyze and evaluate the sufficiency or insufficiency of common ancestry to explain the sudden appearance, stasis, and sequential nature of groups in the fossil record;*~~

The motion carried, with 8 members voting Aye and 7 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Miller*
	Mr. Craig	*Mr. Nuñez*
No:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Leo	

MOTION: *It was moved by Mrs. Dunbar and seconded by Mr. Craig to add §112.34. Biology, subsection (c)(7)(B), as follows:*

(B) analyze and evaluate the sufficiency of scientific explanations concerning any data of sudden appearance, stasis, and the sequential nature of groups in the fossil record;

MOTION AND VOTE: *It was moved by Mr. Craig, seconded by Ms. Dunbar, and carried to amend the motion, as follows:*

(B) analyze and evaluate [~~the sufficiency of~~] scientific explanations concerning any data of sudden appearance, stasis, and the sequential nature of groups in the fossil record;

VOTE: *A vote was taken on the motion, as amended. The motion carried, with 13 members voting Aye and 2 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Ms. Leo*
	Mr. Bradley	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Hardy	*Mr. Nuñez*
	Mrs. Knight	
No:	*Mr. Allen*	*Mrs. Berlanga*

MOTION AND VOTE: *It was moved by Mr. Allen and seconded by Mr. Craig to strike §112.34. Biology, subsection (c)(7)(G), which was approved by the Committee of the Full Board the previous day, as follows:*

[~~(G) analyze and evaluate the sufficiency or insufficiency of natural selection to explain the complexity of the cell.~~]

The motion carried, with 8 members voting Aye and 7 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Miller*
	Mr. Craig	*Mr. Nuñez*
No:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Leo	

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Dr. McLeroy to add §112.34. Biology, subsection (c)(7)(G), as follows:*

(G) analyze and evaluate scientific explanations concerning the complexity of the cell.

The motion carried, with 13 members voting Aye and 2 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Leo*
	Mr. Bradley	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Hardy	*Mr. Nuñez*
	Mrs. Knight	
No:	*Mr. Allen*	*Mrs. Berlanga*

MOTION AND VOTE: *It was moved by Mr. Allen and seconded by Mr. Nuñez to strike §112.34. Biology, subsection (c)(9)(D), which was approved by the Committee of the Full Board the previous day, as follows:*

[~~(D) analyze and evaluate the evidence regarding formation of simple organic molecules and their organization into long complex molecules having information such as the DNA molecule for self-replicating life.~~]

The motion failed, with 5 members voting Aye and 10 members voting No, as follows:

Aye:	*Mr. Allen*	*Mrs. Miller*
	Mrs. Berlanga	*Mr. Nuñez*
	Mrs. Knight	
No:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Bradley	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*

MOTION AND VOTE: *It was moved by Mr. Mercer, seconded by Mr. Bradley, and carried to amend §112.34. Biology, subsection (c)(2)(E), as follows:*

plan and implement descriptive, comparative, and experimental investigations [~~investigative procedures~~], including asking questions, formulating testable hypotheses, and selecting equipment and technology;

Mrs. Berlanga, Mr. Craig, Mrs. Knight, and Mr. Nuñez voted No.

MOTION AND VOTE: *It was moved by Ms. Hardy to amend §112.35. Chemistry, subsection (c)(6)-(12).*

The motion failed, with 5 members voting Aye and 10 members voting No, as follows:

Aye:	*Mr. Craig*	*Mrs. Miller*
	Ms. Hardy	*Mr. Nuñez*
	Mrs. Knight	
No:	*Mr. Agosto*	*Ms. Dunbar*
	Mr. Allen	*Ms. Leo*
	Mrs. Berlanga	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Ms. Hardy to amend §112.36. Earth and Space Science, subsection (c)(4), as follows:*

(4) Earth in space and time. The student knows how Earth-based and space-based astronomical observations reveal information [~~differing theories~~] about the structure, scale, composition, origin, and history of the universe.

The motion failed, with 7 members voting Aye and 8 members voting No, as follows:

Aye:	*Mr. Allen*	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Miller*
	Mr. Craig	*Mr. Nuñez*
	Ms. Hardy	
No:	*Mr. Agosto*	*Ms. Leo*
	Mr. Bradley	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*

MOTION AND VOTE: *It was moved by Mrs. Dunbar and seconded by Mr. Craig to amend §112.36. Earth and Space Science, subsection (c)(8)(A), by substituting language, as follows:*

analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data;

The motion carried, with 9 members voting Aye and 6 members voting No, as follows:

Aye:	*Mr. Allen*	*Ms. Hardy*
	Mr. Bradley	*Mrs. Knight*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mrs. Miller*
	Ms. Dunbar	
No:	*Mr. Agosto*	*Mrs. Lowe*
	Mrs. Berlanga	*Mr. Mercer*
	Ms. Leo	*Mr. Nuñez*

MOTION AND VOTE: *It was moved by Mrs. Cargill, seconded by Mr. Nuñez, and carried to amend §112.39. Physics, subsection(c)(5)(C), as follows:*

describe and calculate how the magnitude of the electrical force between two objects depends on their charges and the distance between them [~~their centers~~];

Mrs. Berlanga voted No.

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Mr. Nuñez to add §112.18. Science, Grade 6, subsection (b)(8)(E), as follows:*

(E) investigate how inclined planes and pulleys can be used to change the amount of force to move an object.

The motion carried, with 9 members voting Aye and 6 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Miller*
	Mrs. Cargill	*Mr. Nuñez*
	Mr. Craig	
No:	*Mr. Bradley*	*Mrs. Lowe*
	Ms. Dunbar	*Dr. McLeroy*
	Ms. Leo	*Mr. Mercer*

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Mr. Nuñez to amend §112.19. Science, Grade 7, subsection (b)(14)(C), as follows:*

recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus.

The motion carried, with 8 members voting Aye and 7 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Miller*
	Mr. Craig	*Mr. Nuñez*
No:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Leo	

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Mr. Nuñez to amend §112.20. Science, Grade 8, subsection (b)(9)(B), as follows:*

illustrate how plate tectonics causes major geological events such as ocean basins, earthquakes, volcanic eruptions, and mountain building [~~relate plate tectonics to the formation of crustal features~~]; and

The motion failed, with 7 members voting Aye, 7 members voting No, and 1 member Abstaining, as follows:

Aye:	*Mr. Allen*	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Miller*
	Mr. Craig	*Mr. Nuñez*
	Ms. Hardy	
No:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Leo	
Abstain:	*Mr. Agosto*	

VOTE: *A vote was taken on the motion that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School, as amended, with an effective date of 20 days after filing as adopted with the Texas Register. The motion carried, with 13 members voting Aye and 2 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Ms. Leo*
	Mr. Bradley	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Hardy	
No:	*Mrs. Berlanga*	*Mr. Nuñez*

(ATTACHMENT 2, page 21)

4. Approval of Question and Answer Document for the Midcycle 2010 Proclamation
(Board agenda page I-69)

MOTION AND VOTE: *It was moved by Mrs. Miller, seconded by Ms. Dunbar, and carried unanimously to approve the Question and Answer document for the Midcycle 2010 Proclamation.*

(ATTACHMENT 3, page 87)

5. Consideration of Options for Graduation Credit for Athletics
(Board agenda page I-71)

MOTION: *It was recommended by the Committee of the Full Board that the State Board of Education select Option 2 with a timeline that would postpone implementation and place this item on the State Board of Education agenda for first reading and filing authorization in September 2009.*

MOTION: *It was moved by Mr. Bradley and seconded by Mrs. Miller to table this item.*

Dr. McLeroy explained that this motion was out of order. Kirk Overbey, parliamentarian, read from *Robert's Rules of Order, Newly Revised*, page 202, "…the motion to *Lay on the Table* is out of order if the evident intent is to kill or avoid dealing with a measure."

MOTION AND VOTE: *It was moved by Mr. Bradley and seconded by Mrs. Miller to postpone this item indefinitely. The motion failed, with 3 members voting Aye, 11 members voting No, and 1 member Abstaining, as follows:*

Aye:	*Mr. Bradley*	*Mrs. Miller*
	Ms. Leo	
No:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mrs. Lowe*
	Mrs. Berlanga	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mr. Craig	*Mr. Nuñez*
	Ms. Dunbar	
Abstain:	*Ms. Hardy*	

VOTE: *A vote was taken on the motion to select Option 2 with a timeline that would postpone implementation and place this item on the State Board of Education agenda for first reading and filing authorization in September 2009.*

The motion carried, with 11 members voting Aye and 4 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Lowe*
	Mrs. Berlanga	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Mr. Craig	*Mr. Nuñez*
	Ms. Dunbar	
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Knight	*Mrs. Miller*

(ATTACHMENT 4, page 95)

6. Proposed Amendment to 19 TAC Chapter 30, Administration, Subchapter A, State Board of Education: General Provisions, §30.1, Petition for Adoption of Rule Changes
(Second Reading and Final Adoption)
(Board agenda page I-81)

MOTION AND VOTE: *It was moved by Mrs. Miller, seconded by Mr. Craig, and carried by an affirmative vote of two-thirds of the members of the board to approve for second reading and final adoption the proposed amendment to 19 TAC Chapter 30, Administration, Subchapter A, State Board of Education: General Provisions, §30.1, Petition for Adoption of Rule Changes, with an effective date of 20 days after filing as adopted with the Texas Register.*

(ATTACHMENT 5, page 97)

COMMITTEE ON INSTRUCTION (Mrs. Cargill, chair)

7. Adoption of Review of 19 TAC Chapter 101, Assessment
(Adoption of Review)
(Board agenda page II-1)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

8. Requests to Approve Substitutions of Instructional Materials
(Board agenda page II-43)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND (Mr. Bradley, chair)

9. Proposed Amendment to 19 TAC Chapter 129, Student Attendance, Subchapter B, Student Attendance Accounting, §129.21, Requirements for Student Attendance Accounting for State Funding Purposes
(Second Reading and Final Adoption)
(Board agenda page III-1)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption the proposed amendment to 19 TAC Chapter 129, Student Attendance, Subchapter B, Student Attendance Accounting, §129.21, Requirements for Student Attendance Accounting for State Funding Purposes, with an effective date of 20 days after filing as adopted with the Texas Register. The motion carried unanimously.*

(ATTACHMENT 6, page 99)

10. Proposed Amendment to 19 TAC Chapter 30, Administration, Subchapter B, State Board of Education: Purchasing and Contracts, §30.21, Historically Underutilized Business (HUB) Program
(Second Reading and Final Adoption)
(Board agenda page III-7)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption the proposed amendment to 19 TAC Chapter 30, Administration, Subchapter B, State Board of Education: Purchasing and Contracts, §30.21, Historically Underutilized Business (HUB) Program, with an effective date of 20 days after filing as adopted with the Texas Register. The motion carried unanimously.*

(ATTACHMENT 7, page 101)

11. Proposed Ratification of Increase in the Reserve for the Guarantee Program for School District Bonds
(Board agenda page III-11)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education to ratify the increase of the amount of capacity held in reserve for the guarantee program for school district bonds from 5 percent to 8 percent of the Permanent School Fund's capacity to guarantee bonds. (Mrs. Berlanga, Mr. Craig, and Mrs. Miller were absent for the vote.)*

12. Search for Outside Legal Counsel for the Permanent School Fund
(Board agenda page III-13)

No action was taken on this item.

13. Decision on a Real Estate Policy Statement
(Board agenda page III-15)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education, to approve the Texas Permanent School Fund Real Estate Investment Policy Statement dated March 2009. (Mrs. Berlanga, Mr. Craig, and Mrs. Miller were absent for the vote.)*

14. Authorization to Issue a Request for Proposals for Global Custody and Securities Lending Services for the Permanent School Fund
(Board agenda page III-19)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education, to approve the issuance of a Request for Proposals for Global Custody and Securities Lending Services for the Permanent School Fund. (Mrs. Berlanga, Mr. Craig, and Mrs. Miller were absent for the vote.)*

15. Authorization to Issue a Request for Proposals for a Private Equity Discretionary Separate Account Manager
(Board agenda page III-21)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education to approve issuance of a Request for Proposals for Private Equity Discretionary Separate Account Manager for the Permanent School Fund. (Mrs. Berlanga, Mr. Craig, and Mrs. Miller were absent for the vote.)*

16. Authorization to Issue a Request for Proposals for Performance Measurement Services for the Permanent School Fund
(Board agenda page III-23)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education to approve the issuance of a Request for Proposals for Performance Measurement Services for the Permanent School Fund. (Mrs. Berlanga, Mr. Craig, and Mrs. Miller were absent for the vote.)*

COMMITTEE ON SCHOOL INITIATIVES (Mr. Craig, chair)

No action items.

REPORTS OF COMMITTEES REGARDING AGENDA ITEMS ON COMMITTEE AGENDAS

Committee on Instruction

No report was presented.

Committee on School Finance/Permanent School Fund

Mr. Bradley reported on the following discussion items of the Committee on School Finance/Permanent School Fund meeting held on February 20, 2009: Discussion of the Permanent School Fund Organization; Discussion on Process; Discussion of Real Estate Investment; and Discussion of the Search for Outside Legal Counsel for the Permanent School Fund. He also reported on the following discussion items of the committee meeting held on March 25, 2009: Report by Weaver & Tidwell on the Audit of the Permanent School Fund's Financial Statements for the Period Ending August 31, 2008; Review of Permanent School Fund Securities Transaction; and Discussion of the Real Return Asset Class.

Committee on School Initiatives

No report was presented.

REPORTS OF OTHER STATE BOARD OF EDUCATION MEMBERS REGARDING AGENDA ITEMS AND EDUCATIONAL ACTIVITIES AND CONCERNS IN INDIVIDUAL DISTRICTS

No reports were presented.

The meeting adjourned at 3:50 p.m.

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Terri Leo, Secretary

Social Studies

Minutes
State Board of Education
May 21, 2010

The State Board of Education met at 9:10 a.m. on Friday, May 21, 2010, in the State Board of Education Room, #1-104, of the William B. Travis Building, 1701 N. Congress Avenue, Austin, Texas. All members of the board were present, as follows:

Presiding: Gail Lowe, Chair; Rick Agosto; Lawrence A. Allen, Jr., Vice Chair; Mary Helen Berlanga; David Bradley; Barbara Cargill; Bob Craig; Cynthia Dunbar; Pat Hardy; Mavis B. Knight; Terri Leo, Secretary; Don McLeroy; Ken Mercer; Geraldine Miller; Rene Nuñez

Student Performance

The student performance was provided by the Trinity High School Harmony Show Choir, Hurst-Euless-Bedford Independent School District.

Invocation

Pledge of Allegiance

Approval of Minutes

State Board of Education, March 12, 2010

MOTION AND VOTE: *It was moved by Mr. Craig and carried unanimously to approve the Minutes of the March 12, 2010, meeting of the State Board of Education, as printed.*

Public Testimony - Individual testimony will be taken to address items other than those on the board agenda.

The State Board of Education received two presentations of public testimony, as follows.

NAME:	Paul Aviña
AFFILIATION:	Parent
TOPIC:	Access to Education

NAME:	Paul Henley
AFFILIATION:	Texas State Teachers Association/National Education Association
TOPIC:	State Board for Educator Certification (SBEC)

1. Resolutions and Presentations

There were no resolutions or presentations introduced.

2. Approval of Consent Agenda

Any agenda item may be placed on the consent agenda by any State Board of Education committee. The State Board of Education may elect to take separate action on any item on the consent agenda.

In addition to the items on the original consent agenda, the following agenda items received unanimous approval in committee and were brought forward to the consent agenda for board approval:

- Official Agenda Item #14—Adoption of Review of 19 TAC Chapter 109, Budgeting, Accounting, and Auditing
- Official Agenda Item #18—Review of Proposed Amendments to 19 TAC Chapter 245, Certification of Educators from Other Countries
- Official Agenda Item #19—Review of Proposed Repeal of 19 TAC Chapter 241, Principal Certificate, §241.35, Assessment Process Definition and Approval of Individual Assessments

By unanimous consent, the State Board of Education approved the following items on the consent agenda, including the three items that were brought forward.

(1) Proposed Amendments to 19 TAC Chapter 89, Adaptations for Special Populations, Subchapter D, Special Education Services and Settings
(First Reading and Filing Authorization)
(Board agenda page II-35)
(COMMITTEE ON INSTRUCTION)

The State Board of Education approved for first reading and filing authorization the proposed amendments to 19 TAC Chapter 89, Adaptations for Special Populations, Subchapter D, Special Education Services and Settings.

(2) Proposed Repeal of Career and Technical Education Texas Essential Knowledge and Skills in 19 TAC Chapters 119-125, and Proposed Revisions to 19 TAC Chapter 127, Texas Essential Knowledge and Skills for Career Development
(First Reading and Filing Authorization)
(Board agenda page II-43)
(COMMITTEE ON INSTRUCTION)

The State Board of Education approved for first reading and filing authorization the proposed repeal of Career and Technical Education Texas Essential Knowledge and Skills in 19 TAC Chapters 119-125, and the proposed revisions to 19 TAC Chapter 127, Texas Essential Knowledge and Skills for Career Development.

(3) Proposed Repeal of 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter A, Elementary, §§112.1-112.7, Subchapter B, Middle School, §§112.21-112.24, and Subchapter C, High School, §§112.41-112.49, and Proposed Amendments to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, §§112.10, 112.17, 112.31
(First Reading and Filing Authorization)
(Board agenda page II-53)
(COMMITTEE ON INSTRUCTION)

The State Board of Education approved for first reading and filing authorization the proposed repeal of 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter A, Elementary, §§112.1-112.7, Subchapter B, Middle School, §§112.21-112.24, and Subchapter C, High School, §§112.41-112.49, and the proposed amendments to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, §§112.10, 112.17, 112.31.

(4) Ratification of the Purchases and Sales of the Investment Portfolio of the Permanent School Fund for the Month of February 2010
(Board agenda page III-71)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education ratified the purchases and sales for the month of February 2010 in the amount of $262,933,624 and $163,427,082, respectively, as recommended by the Committee on School Finance/Permanent School Fund.

14. Adoption of Review of 19 TAC Chapter 109, Budgeting, Accounting, and Auditing
(Board agenda page III-17)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education adopted the review of 19 TAC Chapter 109, Budgeting, Accounting, and Auditing, Subchapter A, Budgeting, Accounting, Financial Reporting, and Auditing for School Districts; Subchapter B, Texas Education Agency Audit Functions; Subchapter C, Adoptions by Reference; and Subchapter D, Uniform Bank Bid or Request for Proposal and Depository Contract, as recommended by the Committee on School Finance/Permanent School Fund.

18. Review of Proposed Amendments to 19 TAC Chapter 245, Certification of Educators from Other Countries
(Board agenda page IV-1)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education took no action on the review of proposed amendments to 19 TAC Chapter 245, Certification of Educators from Other Countries, as recommended by the Committee on School Initiatives.

19. Review of Proposed Repeal of 19 TAC Chapter 241, Principal Certificate, §241.35, Assessment Process Definition and Approval of Individual Assessments
(Board agenda page IV-11)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education took no action on the review of proposed repeal of 19 TAC Chapter 241, Principal Certificate, §241.35, Assessment Process Definition and Approval of Individual Assessments, as recommended by the Committee on School Initiatives.

COMMITTEE OF THE FULL BOARD

The Committee of the Full Board at its meeting on Thursday, May 20, 2010, did not discuss Item #4--Review Potential Changes to the Long-Term Strategic Asset Allocation Plan of the Permanent School Fund. Mrs. Lowe reported during that meeting that this item would be discussed at the general board meeting on Friday, May 21, 2010, thus the discussion at this general board meeting. Rhett Humphreys, CFA Partner and Senior Consultant with NEPC LLC, presented and reviewed the handout entitled, "Asset Allocation & Spending Policy Analysis" dated May 20, 2010.

The State Board of Education considered agenda items in the following order: items number 6, 7, 8, 13, 16, 5, 3, 4, 9, 10, 11, 12, 15, and 17.

3. Consideration of Petition for Adoption of Rule Change Concerning 19 TAC Chapter 74, Curriculum Requirements, Subchapter F, Graduation Requirements, Beginning with School Year 2007-2008
(Board agenda page I-1)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to amend §74.61(m), as follows:*

(m) Transition for physical education and science requirements.

(1) Science and physical education graduation requirements successfully completed prior to the 2010-2011 school year shall count toward graduation in the manner established at the time the credit was earned.

(2) Physical education graduation requirements successfully completed through a two- or three-credit career and technical education work-based training course prior to the 2011-2012 school year shall count toward graduation.

[~~(m) High School graduation requirements successfully completed prior to the 2010-2011 school year shall count toward graduation in the manner established at the time the credit was earned.~~]

(Mrs. Miller was absent for the vote.)

4. Proclamation 2012 of the State Board of Education Advertising for Bids on Instructional Materials
(Board agenda page I-21)

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to postpone indefinitely Proclamation 2012 of the State Board of Education Advertising for Bids on Instructional Materials. (Mrs. Miller was absent for the vote.)*

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education to establish a timeline for the request for supplemental science materials that includes the following milestone dates: request issued on May 21, 2010; samples due on March 4, 2011; state review panel meeting in April 2011; and adoption in May 2011. (Mrs. Miller was absent for the vote.)*

MOTION: *It was recommended by the Committee of the Full Board to issue a request for supplemental high school materials for Biology, Chemistry, Integrated Physics and Chemistry (IPC), and Physics to include grades 6, 7, and 8.*

MOTION AND VOTE: *It was moved by Mrs. Knight, seconded by Ms. Hardy, and carried unanimously to issue a request for supplemental science materials that would include grade 5. (Mrs. Miller was absent for the vote.)*

VOTE: *A vote was taken on the motion to issue a request for supplemental high school materials for Biology, Chemistry, Integrated Physics and Chemistry (IPC), and Physics to include grades 5, 6, 7, and 8, as amended. The motion carried unanimously. (Mrs. Miller was absent for the vote.)*

Anita Givens, associate commissioner for standards and programs, presented the Cost Options for Supplemental Science Materials. The State Board of Education, without objection, directed staff to pursue Option C.

MOTION AND VOTE: *It was recommended by the Committee of the Full Board and carried unanimously by the State Board of Education that the requested supplemental science materials cover all of the new science standards and that the commissioner of education and agency staff be allowed the flexibility to determine the extent to which the existing 19 TAC Chapter 66 rules would apply to the request for supplemental science materials. (Mrs. Miller was absent for the vote.)*

(ATTACHMENT 1, page 31)

5. Proposed Revisions to 19 TAC Chapter 113, Texas Essential Knowledge and Skills for Social Studies, Subchapter A, Elementary, Subchapter B, Middle School, and Subchapter C, High School, and 19 TAC Chapter 118, Texas Essential Knowledge and Skills for Economics with Emphasis on the Free Enterprise System and Its Benefits, Subchapter A, High School
(Second Reading and Final Adoption)
(Board agenda page I-23)

Mrs. Lowe reported that the board was ready to resume with this item, starting with Subchapter C, High School. Despite working into the night, the Committee of the Full Board was only able to consider Kindergarten through Grade 8 at its meeting the previous day. Mrs. Lowe pointed out that staff had worked on providing committee minutes and rule text for K-5. Attachment 2, which starts on page 33, reflects all amendments that were made on Thursday, May 20, 2010, and includes the amendments reflected below. Attachment 3, which starts on page 79, reflects the rule text.

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mr. Craig, and carried to amend §113.42(c)(1)(C) as follows:*

(C) identify major causes and describe the major effects of the following important turning points in world history from 600 to 1450; the spread of Christianity, the decline of Rome and the formation of medieval Europe; the development of Islamic caliphates and their impact on Asia, Africa, and Europe; the Mongol invasions and their impact on Europe, China, India, and Southwest Asia[~~, and the Mesoamerican civilizations~~];

(Mr. Agosto and Mr. Bradley were absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mr. Craig, and carried to amend §113.42(c)(7)(F) as follows:*

(F) explain new economic [~~three pro-free-market~~] factors and principles that contributed to the success of Europe's Commercial Revolution.

(Mr. Agosto was absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy and seconded by Mr. Craig to amend §113.42(c)(8)(E) as follows:*

(E) explain the effects [~~benefits~~] of free enterprise in the Industrial Revolution.

The motion carried, with 8 members voting Aye and 6 members voting No, as follows:

Aye:	*Mr. Allen*	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Lowe*
	Mr. Craig	*Mrs. Miller*
	Ms. Hardy	*Mr. Nuñez*
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*

(Mr. Agosto was absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mr. Craig, and carried to amend §113.42(c)(25)(C) as follows:*

(C) explain the relationship among Christianity, individualism, and growing secularism that began with the Renaissance and how the relationship influenced subsequent political developments; and

MOTION: *It was moved by Ms. Hardy and seconded by Dr. McLeroy to amend §113.42(c)(27)(A) as follows:*

(A) identify the origin and diffusion of major ideas in mathematics, science, and technology that occurred in river valley civilizations, classical Greece and Rome, classical India, and the Islamic caliphates between 700 and 1200 and in China from the Tang to Ming dynasties such as Archimedes, Copernicus, Eratosthenes, Galileo, Pythagoras, Robert Boyle, and Isaac Newton;

MOTION AND VOTE: *It was moved by Ms. Leo and seconded by Mrs. Cargill to amend §113.42(c)(27)(A) as follows:*

(A) identify the origin and diffusion of major ideas in mathematics, science, and technology that occurred in river valley civilizations, classical Greece and Rome, classical India, and the Islamic caliphates between 700 and 1200 and in China from the Tang to Ming dynasties, including [~~such as~~] Archimedes, Copernicus, Eratosthenes, Galileo, Pythagoras, Robert Boyle, and Isaac Newton;

The motion failed, with 5 members voting Aye and 10 members voting No, as follows:

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mr. Mercer*
	Ms. Dunbar	
No:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mrs. Lowe*
	Mrs. Berlanga	*Dr. McLeroy*
	Mr. Craig	*Mrs. Miller*
	Ms. Hardy	*Mr. Nuñez*

VOTE: *A vote was taken on the motion to amend §113.42(c)(27)(A) as follows:*

(A) identify the origin and diffusion of major ideas in mathematics, science, and technology that occurred in river valley civilizations, classical Greece and Rome, classical India, and the Islamic caliphates between 700 and 1200 and in China from the Tang to Ming dynasties such as Archimedes, Copernicus, Eratosthenes, Galileo, Pythagoras, Robert Boyle, and Isaac Newton;

The motion carried.

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Dr. McLeroy, and carried to strike §113.42(c)(27)(E) as follows:*

[~~(E) identify the contributions of significant scientists such as Archimedes, Copernicus, Galileo, and Pythagoras.~~]

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Dr. McLeroy, and carried to amend §113.42(c)(28)(E) as follows:*

(E) identify the contributions of significant scientists and inventors such as [~~Robert Boyle~~,] Marie Currie, Thomas Edison, Albert Einstein, [~~Isaac Newton~~,] Louis Pasteur, and James Watt.

MOTION AND VOTE: *It was moved by Dr. McLeroy and seconded by Mr. Craig to amend §113.42(c)(28)(E) as follows:*

(E) identify the contributions of significant scientists and inventors such as Marie Currie, Thomas Edison, Albert Einstein, Louis Pasteur, Alan Turing, and James Watt.

The motion failed, with 4 members voting Aye and 11 members voting No, as follows:

Aye:	*Mrs. Cargill*	*Dr. McLeroy*
	Mrs. Knight	*Mrs. Miller*
No:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Ms. Leo*
	Mrs. Berlanga	*Mrs. Lowe*
	Mr. Bradley	*Mr. Mercer*
	Mr. Craig	*Mr. Nuñez*
	Ms. Dunbar	

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Mr. Nuñez to add a new statement to the introduction of §113.42 to read as follows:*

Students understand that current sociology terminology BCE references BC and CE references AD.

The motion failed, with 7 members voting Aye and 8 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mrs. Miller*
	Mrs. Berlanga	*Mr. Nuñez*
	Mr. Craig	
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Ms. Dunbar	*Dr. McLeroy*
	Ms. Hardy	*Mr. Mercer*

MOTION AND VOTE: *It was moved by Mrs. Cargill and seconded by Mrs. Miller to amend §113.42(c)(18)(A) as follows:*

(A) identify the historic origins and characteristics of the free enterprise system, including the contributions of Adam Smith, especially the influence of his ideas found in "The Wealth of Nations";

The motion carried, with 8 members voting Aye and 7 members voting No, as follows:

Aye:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Leo	*Mrs. Miller*
No:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mr. Nuñez*
	Mr. Craig	

MOTION: *It was moved by Mrs. Cargill and seconded by Dr. McLeroy to add new §113.42(c)(18)(E) to read as follows:*

(E) explain why communist command economies collapsed in competition with free-market economies at the end of the 20th century.

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Nuñez to amend the proposed new §113.42(c)(18)(E) as follows:*

(E) explain why communist [~~command~~] economies collapsed in competition with free-market economies at the end of the 20th century.

The motion failed.

VOTE: *A vote was taken on the motion to add new §113.42(c)(18)(E) to read as follows:*

(E) explain why communist command economies collapsed in competition with free-market economies at the end of the 20th century.

The motion carried, with 10 members voting Aye and 5 members voting No, as follows:

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Mrs. Knight	*Mrs. Miller*
No:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mr. Nuñez*
	Mrs. Berlanga	

MOTION: *It was moved by Mrs. Cargill and seconded by Dr. McLeroy to add new §113.42(c)(18)(F) to read as follows:*

(F) formulate generalizations on how economic freedom improved the human condition, based on students' knowledge of the benefits of free enterprise in Europe's Commercial Revolution, the Industrial Revolution, and 20th century free-market economies compared to communist command communities.

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Ms. Hardy to amend the proposed new §113.42(c)(18)(F) as follows:*

(F) formulate generalizations on how economic freedom improved the human condition, based on students' knowledge of the effects [~~benefits~~] of free enterprise in Europe's Commercial Revolution, the Industrial Revolution, and 20th century free-market economies compared to communist command communities.

The motion failed, with 5 members voting Aye, 9 members voting No, and 1 member Abstaining, as follows:

Aye:	*Mr. Allen*	*Mrs. Knight*
	Mr. Craig	*Mrs. Miller*
	Ms. Hardy	
No:	*Mrs. Berlanga*	*Mrs. Lowe*
	Mr. Bradley	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Ms. Dunbar	*Mr. Nuñez*
	Ms. Leo	
Abstain:	*Mr. Agosto*	

VOTE: *A vote was taken on the motion to add new §113.42(c)(18)(F) to read as follows:*

(F) formulate generalizations on how economic freedom improved the human condition, based on students' knowledge of the benefits of free enterprise in Europe's Commercial Revolution, the Industrial Revolution, and 20th century free-market economies compared to communist command communities.

The motion carried, with 9 members voting Aye, 5 members voting No, and 1 member Abstaining, as follows:

Aye:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Leo	
No:	*Mr. Allen*	*Mrs. Knight*
	Mrs. Berlanga	*Mr. Nuñez*
	Ms. Hardy	
Abstain:	*Mr. Agosto*	

MOTION: *It was moved by Mrs. Cargill and seconded by Dr. McLeroy to amend §113.42(c)(18) as follows:*

(18) Economics. The student understands the historic origins of contemporary economic systems and the benefits of free enterprise in world history. The student is expected to:

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Allen to amend the proposed language to §113.42(c)(18) as follows:*

(18) Economics. The student understands the historic origins of contemporary economic systems and the effects [~~benefits~~] of free enterprise in world history. The student is expected to:

The motion failed, with Mr. Agosto abstaining.

VOTE: *A vote was taken on the motion to amend §113.42(c)(18) as follows:*

(18) Economics. The student understands the historic origins of contemporary economic systems and the benefits of free enterprise in world history. The student is expected to:

The motion carried, with 9 members voting Aye, 5 members voting No, and 1 member Abstaining, as follows:

Aye:	*Mr. Bradley*	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Leo	
No:	*Mr. Allen*	*Mrs. Knight*
	Mrs. Berlanga	*Mr. Nuñez*
	Ms. Hardy	
Abstain:	*Mr. Agosto*	

MOTION AND VOTE: *It was moved by Mr. Nuñez, seconded by Mr. Craig, and carried to amend §113.42(c)(22)(E) as follows:*

(E) identify examples of individuals who led resistance to political oppression such as Nelson Mandela, Mohandas Gandhi, Oscar Romero, Natan Sharansky, Las Madres de la Plaza de Mayo, and Chinese student protestors in Tiananmen Square; and

MOTION AND VOTE: *It was moved by Ms. Dunbar, seconded by Dr. McLeroy, and carried to add new §113.42(c)(21)(C) to read as follows:*

(C) identify examples of key persons who were successful in shifting political thought, including William Wilberforce.

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Dr. McLeroy to amend §113.42(c)(20)(C) as follows:*

(C) explain the impact of Enlightenment ideas from the writings of John Locke, Thomas Hobbes, Voltaire, Charles de Montesquieu, Jean Jacques Rousseau, Thomas Aquinas, Thomas Jefferson [~~John Calvin~~], and William Blackstone; and

The motion failed, with 7 members voting Aye and 8 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mrs. Miller*
	Mrs. Berlanga	*Mr. Nuñez*
	Mr. Craig	
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Ms. Dunbar	*Dr. McLeroy*
	Ms. Hardy	*Mr. Mercer*

MOTION: *It was moved by Mr. Mercer and seconded by Mr. Bradley to amend §113.42(c)(20)(C) as follows:*

(C) explain the impact of the writings of John Locke, Thomas Hobbes, Voltaire, Charles de Montesquieu, Jean Jacques Rousseau, Thomas Aquinas, John Calvin, Thomas Jefferson, James Madison, and William Blackstone; and

MOTION AND VOTE: *It was moved by Ms. Hardy and seconded by Dr. McLeroy to amend §113.42(c)(20)(C) as follows:*

(C) explain the impact of the writings of John Locke, Thomas Hobbes, Voltaire, Charles de Montesquieu, Jean Jacques Rousseau, Thomas Aquinas, John Calvin, Thomas Jefferson, [~~James Madison,~~] and William Blackstone; and

The motion carried, with 8 members voting Aye and 7 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Lowe*
	Mr. Craig	*Mr. Nuñez*
No:	*Mr. Bradley*	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Leo	

VOTE: *A vote was taken on the motion to amend §113.42(c)(20)(C), as amended, as follows:*

(C) explain the impact of the writings of John Locke, Thomas Hobbes, Voltaire, Charles de Montesquieu, Jean Jacques Rousseau, Thomas Aquinas, John Calvin, Thomas Jefferson, and William Blackstone; and

The motion carried.

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Nuñez to amend §113.42(c)(20)(C) as follows:*

(C) explain the political philosophies of individuals such as [~~impact of the writings of~~] John Locke, Thomas Hobbes, Voltaire, Charles de Montesquieu, Jean Jacques Rousseau, Thomas Aquinas, John Calvin, Thomas Jefferson, and William Blackstone; and

The motion carried, with 11 members voting Aye and 3 members voting No, as follows:

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	*Mrs. Miller*
	Mrs. Knight	
No:	*Mr. Agosto*	*Mr. Nuñez*
	Mrs. Berlanga	

(Mr. Allen was absent for the vote.)

MOTION: *It was moved by Mr. Bradley to amend §113.42(c)(20)(C) as follows:*

(C) explain the political philosophies found in primary sources of individuals such as John Locke, Thomas Hobbes, Voltaire, Charles de Montesquieu, Jean Jacques Rousseau, Thomas Aquinas, John Calvin, Thomas Jefferson, and William Blackstone; and

Mr. Bradley withdrew his motion.

MOTION AND VOTE: *It was moved by Ms. Hardy to reconsider §113.42(c)(27)(A) and §113.42(c)(27)(E) previously acted upon. There was no objection from the board to the reconsideration.*

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Dr. McLeroy, and carried to amend §113.42(c)(27)(A) and §113.42(c)(27)(E) as follows:*

(A) identify the origin and diffusion of major ideas in mathematics, science, and technology that occurred in river valley civilizations, classical Greece and Rome, classical India, and the Islamic caliphates between 700 and 1200 and in China from the Tang to Ming dynasties [~~such as Archimedes, Copernicus, Eratosthenes, Galileo, and Pythagoras, Robert Boyle, and Isaac Newton~~];

(E) identify the contributions of significant scientists such as Archimedes, Copernicus, Eratosthenes, Galileo, Pythagoras, Isaac Newton, and Robert Boyle.

MOTION AND VOTE: *It was moved by Dr. McLeroy to reconsider §113.42(c)(18)(F) previously acted upon. There was no objection from the board to the reconsideration.*

MOTION AND VOTE: *It was moved by Dr. McLeroy and seconded by Ms. Hardy to amend §113.42(c)(18)(F) as follows:*

(F) compare and contrast the success of communist and free enterprise systems. [~~formulate generalizations on how economic freedom improved the human condition, based on students' knowledge of the benefits of free enterprise in Europe's Commercial Revolution, the Industrial Revolution, and 20th century free-market economies compared to communist command communities.~~]

The motion failed, with 7 members voting Aye and 8 members voting No, as follows:

Aye:	*Mr. Allen*	*Mrs. Knight*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Hardy	
No:	*Mr. Agosto*	*Ms. Leo*
	Mrs. Berlanga	*Mrs. Lowe*
	Mr. Bradley	*Mr. Mercer*
	Mrs. Cargill	*Mr. Nuñez*

VOTE: *A vote was taken on the motion to approve the previously adopted language to §113.42(c)(18)(F) as follows:*

(F) formulate generalizations on how economic freedom improved the human condition, based on students' knowledge of the benefits of free enterprise in Europe's Commercial Revolution, the Industrial Revolution, and 20th century free-market economies compared to communist command communities.

The motion carried, with 10 members voting Aye and 5 members voting No, as follows:

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	*Mrs. Miller*
No:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Nuñez*
	Mrs. Berlanga	

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mrs. Cargill, and carried to amend §113.43(c)(11)(B) as follows:*

(B) identify the [~~examine~~] factors affecting the location of different types of economic activities, including subsistence and commercial agriculture, manufacturing, and service industries [~~,natural resources, manufacturing, agriculture, services, and cottage industry~~]; and

(Mr. Agosto was absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mr. Craig, and carried to amend §113.43(c)(16)(A) as follows:*

(A) describe distinctive cultural patterns and landscapes associated with different places in Texas, the United States, and other regions of the world, and how these patterns influenced the processes of [~~how physical geography, human adaption, and technology influence culture and impact~~] innovation and diffusion;

(Mr. Agosto was absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Dr. McLeroy, and carried to amend §113.43(c)(16)(B) as follows:*

(B) describe elements of culture, including language, religion, beliefs and customs, institutions, and technologies [~~entertainment, food, language, religion, recreation, and fashion~~];

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mr. Craig, and carried to strike §113.43(c)(21)(A) and to amend §113.43(c)(21)(B) as follows:*

[~~(A) interpret reference and thematic maps using elements, including latitude and longitude, to determine absolute location;~~

(A)[~~(B)~~] analyze and evaluate the validity and utility of multiple sources of geographic information such as primary and secondary sources, aerial photographs, and maps [~~use historical, geographic, and statistical information from a variety of sources such as databases (graphs and charts), photographs, GIS, and media services to infer geographic relationships and solve geographic problems~~];

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mrs. Miller, and carried to strike §113.43(c)(21)(C) as follows:*

[~~(C) evaluate the context, bias, validity, and utility of a variety of primary and secondary sources;~~]

MOTION AND VOTE: *It was moved by Dr. McLeroy and seconded by Mr. Craig to amend §113.43(b)(1) as follows:*

(1) In World Geography Studies, students examine people, places, and environments at local, regional, national, and international scales from the spatial and ecological perspectives of geography. Students describe the influence of geography on events of the past and present with emphasis on [~~contemporary~~] issues of the historical time. A significant portion of the course centers around the physical processes that shape patterns in the physical environment; the characteristics of major landforms, climates, and ecosystems and their interrelationships; the political, economic, and social processes that shape cultural patterns of regions; types and patterns of settlement; the distribution and movement of the world population; relationships among people, places, and environments; and the concept of region. Students analyze how location affects economic activities in different economic systems. Students identify the processes that influence political divisions of the planet and analyze how different points of view affect the development of public policies. Students compare how components of culture shape the characteristics of regions and analyze the impact of technology and human modifications on the physical environment. Students use problem-solving and decision-making skills to ask and answer geographic questions.

The motion failed.

MOTION AND VOTE: *It was moved by Mrs. Cargill and seconded by Dr. McLeroy to amend §113.43(c)(14)(C) as follows:*

(C) analyze the human and physical factors that influence the power to control territory and resources, create conflict/war, and impact international political relations of sovereign nations such as China, the United States, Japan, and Russia and organized nation groups such as the United Nations (UN), the European Union (EU), or the control of resources.

The motion carried, with 10 members voting Aye and 5 members voting No, as follows:

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	*Mrs. Miller*
No:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Nuñez*
	Mrs. Berlanga	

MOTION: *It was moved by Mr. Craig and seconded by Dr. McLeroy to add new §113.44(c)(7)(G) to read as follows:*

(G) examine the reasons the Founding Fathers protected religious freedom in America and guaranteed it free exercise by saying that Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof, and compare and contrast this to the phrase "separation of church and state."

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Dr. McLeroy to amend the proposed new language to §113.44(c)(7)(G) as follows:*

(G) examine the reasons the Founding Fathers protected religious freedom in America and guaranteed it free exercise by saying that Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof, by prohibiting government from promoting or favoring any particular religion over all others [~~and compare and contrast this to the phrase "separation of church and state"~~].

The motion failed, with 5 members voting Aye and 10 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Nuñez*
	Mrs. Berlanga	
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	*Mrs. Miller*

VOTE: *A vote was taken on the motion to add new §113.44(c)(7)(G) to read as follows:*

(G) examine the reasons the Founding Fathers protected religious freedom in America and guaranteed it free exercise by saying that Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof, and compare and contrast this to the phrase "separation of church and state."

The motion carried, with 11 members voting Aye and 3 members voting No, as follows:

Aye:	*Mr. Allen*	*Ms. Leo*
	Mr. Bradley	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Hardy	
No:	*Mrs. Berlanga*	*Mr. Nuñez*
	Mrs. Knight	

(Mr. Agosto was absent for the vote.)

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Nuñez to amend §113.44(b)(1), §113.44(c)(12)(A), §113.44(c)(15), and §113.44(c)(16) by striking the words "constitutional republic" and inserting the words "democratic society." The motion failed.*

MOTION AND VOTE: *It was moved by Ms. Dunbar, seconded by Dr. McLeroy, and carried, with Mrs. Berlanga opposing, to add a statement to the introduction for all social studies courses to read as follows:*

Students understand that a constitutional republic is a representative form of government whose representatives derive their authority from the consent of the governed, serve for an established tenure, and are sworn to uphold the Constitution.

MOTION AND VOTE: *It was moved by Mrs. Berlanga and seconded by Mr. Nuñez to amend §113.44(c)(16)(A) as follows:*

(A) examine different points of view of political parties and interest groups such as the League of United Latin American Citizens (LULAC), established due to the discrimination of Hispanics, the National Rifle Association (NRA), the GI Forum, due to the discrimination of veterans, and the National Association for the Advancement of Colored People (NAACP) on important contemporary issues; and

The motion failed, with 7 members voting Aye and 8 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Mercer*
	Mrs. Berlanga	*Mr. Nuñez*
	Mr. Craig	
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Ms. Dunbar	*Dr. McLeroy*
	Ms. Hardy	*Mrs. Miller*

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Mr. Nuñez to add new §113.46(c)(12)(A) to read as follows:*

(A) differentiate between sex, a biological and physical characteristic, and gender, a social construct, and discuss how gender and socialization interact;

The motion failed.

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Mr. Nuñez to amend §113.46(c)(7)(C) and add new §113.46(c)(7)(D) as follows:*

(C) identify issues and concerns facing contemporary adolescents such as dating, dating violence, sexuality, teen parenting, drug use, suicide, and eating disorders[~~, including the importance of personal responsibility for life choices.~~] ;

(D) identify and discuss the skills adolescents need to make responsible life choices.

The motion carried, with 8 members voting Aye and 7 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mrs. Lowe*
	Mr. Craig	*Mr. Nuñez*
No:	*Mr. Bradley*	*Dr. McLeroy*
	Mrs. Cargill	*Mr. Mercer*
	Ms. Dunbar	*Mrs. Miller*
	Ms. Leo	

MOTION AND VOTE: *It was moved by Mrs. Cargill, seconded by Dr. McLeroy, and carried, to amend §113.46(c)(11)(E) as follows:*

(E) explain instances of [~~how~~] institutional racism [~~is evident~~] in American society.

MOTION: *It was recommended by the Committee of the Full Board that the State Board of Education approve for second reading and final adoption proposed revisions to 19 TAC Chapter 113, Texas Essential Knowledge and Skills for Social Studies, Subchapter A, Elementary, and Subchapter B, Middle School, as amended, with an effective date of the beginning of the 2010-2011 school year, to be implemented with the 2011-2012 school year.*

MOTION AND VOTE: *It was moved by Mr. Craig, seconded by Ms. Dunbar, and carried to amend §113.12(b)(13)(A) as follows:*

(A) identify characteristics of good citizenship, including truthfulness, justice, equality, respect for oneself and others, responsibility in daily life, and participation in government by educating oneself about the issues, respectfully holding public officials to their word, and voting;

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mrs. Cargill, and carried to amend §113.15(b)(1)(C) as follows:*

(C) describe the regions in which American Indians lived and identify American Indian groups remaining [~~living~~] in Texas such as Ysleta Del Sur Pueblo, Alabama-Coushatta, and Kickapoo.

MOTION: *It was moved by Mr. Bradley that the State Board of Education approve for second reading and final adoption proposed revisions to 19 TAC Chapter 113, Texas Essential Knowledge and Skills for Social Studies, Subchapter C, High School, as amended, with an effective date of the beginning of the 2010-2011 school year, to be implemented with the 2011-2012 school year.*

MOTION AND VOTE: *It was moved by Ms. Leo and seconded by Dr. McLeroy to amend §113.41(c)(21)(A) as follows:*

(A) analyze the effect of landmark U.S. Supreme Court decisions, including Brown v. Board of Education, and other U.S. Supreme Court decisions such as Plessy v. Ferguson, Hernandez v. Texas, Tinker v. Des Moines, Wisconsin v. Yoder[~~, and White v. Regester~~]; and

The motion failed, with 6 members voting Aye and 8 members voting No, as follows:

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Ms. Dunbar	*Dr. McLeroy*
No:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mr. Mercer*
	Mr. Craig	*Mr. Nuñez*

(Mrs. Miller was absent for the vote.)

MOTION: *It was moved by Ms. Leo to amend §113.41(c)(21)(A) by adding Mobile v. Bolden. The motion died for a lack of a second.*

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Dr. McLeroy to add new §113.41(c)(8)(C) to read as follows:*

(C) critique the scholarly debate over the veracity of the Venona papers;

The motion failed, with 5 members voting Aye and 9 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Nuñez*
	Mrs. Berlanga	
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mrs. Berlanga, seconded by Mr. Craig, and carried to amend §113.41(c)(9)(C), as follows:*

(C) identify the roles of significant leaders who supported various rights movements, including Martin Luther King Jr., Cesar Chavez, Rosa Parks, Hector P. Garcia, and Betty Friedan;

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mrs. Berlanga, seconded by Mr. Craig, and carried to amend §113.41(c)(24)(B) as follows:*

(B) evaluate the contributions of significant political and social leaders in the United States such as Andrew Carnegie, [~~Hector P. Garcia,~~] Thurgood Marshall, Billy Graham, Barry Goldwater, Sandra Day O'Connor, and Hillary Clinton.

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mrs. Knight, seconded by Mr. Craig, and carried to add new §113.41(c)(9)(E) to read as follows:*

(E) discuss the impact of the writings of Martin Luther King Jr., such as "I Have a Dream" speech and "Letter from Birmingham Jail" on the civil rights movement.

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Mrs.Berlanga to strike §113.41(c)(10)(E) as follows:*

~~[(E) describe the causes and key organizations and individuals of the conservative resurgence of the 1980s and 1990s, including Phyllis Schlafly, the Contract with America, the Heritage Foundation, the Moral Majority, and the National Rifle Association; and]~~

The motion failed, with 5 members voting Aye and 8 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Nuñez*
	Mrs. Berlanga	
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*

(Ms. Hardy and Mrs. Miller were absent for the vote.)

MOTION AND VOTE: *It was moved by Mr. Allen and seconded by Mr. Agosto that the State Board of Education postpone until its July meeting the proposed revisions to 19 TAC Chapter 113, Texas Essential Knowledge and Skills for Social Studies, Subchapter C, High School, for second reading and final adoption. The motion failed, with 6 members voting Aye and 8 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Mr. Craig*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mr. Nuñez*
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Ms. Dunbar	*Dr. McLeroy*
	Ms. Hardy	*Mr. Mercer*

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mrs. Knight, seconded by Mr. Nuñez, and carried to amend §113.41(c)(29)(H) as follows:*

(H) use appropriate skills to analyze and interpret social studies information such as maps, graphs, presentations, speeches, lectures, and political cartoons.

(Mr. Agosto, Mrs. Berlanga, and Mrs. Miller were absent for the vote.)

MOTION AND VOTE: *It was moved by Mrs. Knight to add §113.41(c)(30)(D) to read as follows:*

(D) attribute ideas and information to source materials and authors using a standard citation method.

The motion failed.

(Mrs. Miller was absent for the vote.)

VOTE: *A vote was taken on the motion to approve for second reading and final adoption proposed revisions to 19 TAC Chapter 113, Texas Essential Knowledge and Skills for Social Studies, Subchapter C, High School, as amended, with an effective date of the beginning of the 2010-2011 school year, to be implemented with the 2011-2012 school year. The motion carried, with 9 members voting Aye and 5 members voting No, as follows:*

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	
No:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Nuñez*
	Mrs. Berlanga	

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mr. Agosto and seconded by Mrs. Berlanga to strike §113.19(b)(5)(C) as follows:*

[~~(C) identify significant individuals and events concerning Texas and the Civil War such as John Bell Hood, John Reagan, Francis Lubbock, Thomas Green, John Magruder and the Battle of Galveston, the Battle of Sabine Pass, and the Battle of Palmito Ranch.~~]

The motion failed, with 6 members voting Aye and 8 members voting No, as follows:

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Mr. Nuñez*
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mr. Agosto and seconded by Mrs. Berlanga to amend §113.20 (b)(8)(C) as follows:*

(C) analyze Abraham Lincoln's ideas about liberty, equality, union, and government as contained in his first and second inaugural addresses and the Gettysburg Address [~~and contrast them with the ideas contained in Jefferson Davis's inaugural address~~].

The motion failed, with 4 members voting Aye and 10 members voting No, as follows:

Aye:	*Mr. Agosto*	*Mrs. Berlanga*
	Mr. Allen	*Mr. Nuñez*
No:	*Mr. Bradley*	*Mrs. Knight*
	Mrs. Cargill	*Ms. Leo*
	Mr. Craig	*Mrs. Lowe*
	Ms. Dunbar	*Dr. McLeroy*
	Ms. Hardy	*Mr. Mercer*

(Mrs. Miller was absent for the vote.)

MOTION: *It was moved by Mr. Craig and seconded by Ms. Leo to approve for second reading and final adoption proposed revisions to 19 TAC Chapter 113, Texas Essential Knowledge and Skills for Social Studies, Subchapter A, Elementary, and Subchapter B, Middle School, as amended.*

MOTION: *It was moved by Mrs. Knight to add in the introductory statements K through 8 the following language: Students build a foundation to develop skills that will enable them to compete with people all over the globe to experience a successful prosperous career.*

The motion failed for a lack of a second.

VOTE: *A vote was taken on the motion to approve for second reading and final adoption proposed revisions to 19 TAC Chapter 113, Texas Essential Knowledge and Skills for Social Studies, Subchapter A, Elementary, and Subchapter B, Middle School, as amended, with an effective date of the beginning of the 2010-2011 school year, to be implemented with the 2011-2012 school year.*

The motion carried, with 9 members voting Aye and 5 members voting No, as follows:

Aye:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mrs. Lowe*
	Mr. Craig	*Dr. McLeroy*
	Ms. Dunbar	*Mr. Mercer*
	Ms. Hardy	
No:	*Mr. Agosto*	*Mrs. Knight*
	Mr. Allen	*Mr. Nuñez*
	Mrs. Berlanga	

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mrs. Knight and seconded by Ms. Hardy to add new §118.4(c)(1)(E) to read as follows:*

(E) explain the concepts of socioeconomic status and stratification.

The motion failed.

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Dr. McLeroy, and carried to amend §118.4(c)(5)(E) as follows:*

(E) analyze the importance of various economic philosophers, including Friedrich Hayek, Milton Friedman, John Maynard Keynes, [~~Karl Marx,~~] and Adam Smith, and their impact on the U.S. free enterprise system.

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Dr. McLeroy, and carried to amend §118.4(c)(10)(A) as follows:*

(A) interpret economic data, including unemployment rate, gross domestic product, gross domestic product per capita as a measure of national wealth, and rate of inflation; and

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Mr. Craig, and carried to amend §118.4(c)(12)(B) and to strike §118.4(c)(12)(C) as follows:*

(B) describe the characteristics of money, including commodity money, fiat money, and representative money; and

[~~(C) analyze the costs and benefits of commodity money, fiat money, and representative money; and~~]

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Ms. Hardy, seconded by Dr. McLeroy, and carried to amend §118.4(c)(18)(D) as follows:*

(D) demonstrate how to maintain a checking account, including [~~balancing a checkbook or~~] reconciling a bank statement;

(Mrs. Miller was absent for the vote.)

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Nuñez to approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 118, Texas Essential Knowledge and Skills for Economics with Emphasis on the Free Enterprise System and Its Benefits, Subchapter A, High School, as amended, with an effective date of the beginning of the 2010-2011 school year, to be implemented beginning with the 2011-2012 school year. The motion carried, with 14 members voting Aye and 0 members voting No, as follows:*

Aye:	*Mr. Agosto*	*Ms. Hardy*
	Mr. Allen	*Mrs. Knight*
	Mrs. Berlanga	*Ms. Leo*
	Mr. Bradley	*Mrs. Lowe*
	Mrs. Cargill	*Dr. McLeroy*
	Mr. Craig	*Mr. Mercer*
	Ms. Dunbar	*Mr. Nuñez*

(Mrs. Miller was absent for the vote.)

(ATTACHMENT 2, page 33)
(ATTACHMENT 3, page 79)

COMMITTEE ON INSTRUCTION

The Committee on Instruction did not meet the previous day; therefore, no recommendations were made to the full board.

6. Proposed Revisions to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter D, Other Science Courses
(Second Reading and Final Adoption)
(Board agenda page II-1)

MOTION AND VOTE: *It was moved by Mr. Craig, seconded by Dr. McLeroy, and carried by an affirmative vote of two-thirds of the members of the board, to approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 112, Texas Essential Knowledge and Skills for Science, Subchapter D, Other Science Courses, with an effective date of 20 days after filing as adopted with the Texas Register.*

(ATTACHMENT 4, page 181)

7. Proposed Revisions to 19 TAC Chapter 111, Texas Essential Knowledge and Skills for Mathematics, Subchapter D, Other High School Mathematics Courses
(Second Reading and Final Adoption)
(Board agenda page II-17)

MOTION AND VOTE: *It was moved by Mr. Craig, seconded by Dr. McLeroy, and carried by an affirmative vote of two-thirds of the members of the board, to approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 111, Texas Essential Knowledge and Skills for Mathematics, Subchapter D, Other High School Mathematics Courses, with an effective date of 20 days after filing as adopted with the Texas Register.*

(ATTACHMENT 5, page 189)

8. Proposed Revisions to 19 TAC Chapter 89, Adaptations for Special Populations, Subchapter B, Adult Basic and Secondary Education
(Second Reading and Final Adoption)
(Board agenda page II-25)

MOTION AND VOTE: *It was moved by Mr. Craig, seconded by Dr. McLeroy, and carried by an affirmative vote of two-thirds of the members of the board, to approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 89, Adaptations for Special Populations, Subchapter B, Adult Basic and Secondary Education, with an effective date of 20 days after filing as adopted with the Texas Register. (Mr. Agosto was absent for the vote.)*

(ATTACHMENT 6, page 191)

9. Proposed Revisions to 19 TAC Chapter 74, Curriculum Requirements, Subchapter C, Other Provisions
(First Reading and Filing Authorization)
(Board agenda page II-59)

MOTION AND VOTE: *The State Board of Education unanimously approved for first reading and filing authorization the proposed revisions to 19 TAC Chapter 74, Curriculum Requirements, Subchapter C, Other Provisions. (Mrs. Miller was absent for the vote.)*

10. Proposed Approval of Innovative Courses
(Board agenda page II-81)

MOTION AND VOTE: *It was moved by Mr. Nuñez, seconded by Mrs. Cargill, and carried unanimously to approve for a three-year period the innovative courses that do not fall within any of the subject areas of the foundation or enrichment curriculum. (Mr. Agosto, Mr. Craig, and Mrs. Miller were absent for the vote.)*

(ATTACHMENT 7, page 197)

11. Update on Texas Essential Knowledge and Skills (TEKS) Review
(Board agenda page II-87)

No action was taken on this item.

12. Approval for Substitution of Instructional Materials
(Board agenda page II-91)

MOTION AND VOTE: *It was moved by Mrs. Knight and carried unanimously to approve the request from The Math Learning Center to substitute Texas Bridges in Mathematics with Bridges in Mathematics instructional materials at grade 5. (Mr. Craig and Mrs. Miller were absent for the vote.)*

COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND

13. Proposed Amendment to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, §33.65, Guarantee Program for School District Bonds
(Second Reading and Final Adoption)
(Board agenda page III-1)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried by an affirmative vote of two-thirds of the members of the board, to approve for second reading and final adoption the proposed amendment to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, §33.65, Guarantee Program for School District Bonds, with an effective date of 20 days after filing as adopted with the Texas Register.*

(ATTACHMENT 8, page 199)

14. Adoption of Review of 19 TAC Chapter 109, Budgeting, Accounting, and Auditing
(Board agenda page III-17)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

15. Decision on Real Estate Investments
(Board agenda page III-73)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education to approve execution of agreements with INVESCO Core Real Estate Fund and UBS Trumbull Property Fund, necessary to make an investment commitment of up to $100 million in each fund, subject to continued due diligence. (Mr. Craig, Dr. McLeroy, and Mrs. Miller were absent for the vote.)*

16. Proposed Amendment to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, §33.5, Code of Ethics
(Second Reading and Final Adoption)
(Board agenda page III-75)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried by an affirmative vote of two-thirds of the members of the board, to approve for second reading and final adoption proposed amendment to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, §33.5, Code of Ethics, as amended, with an effective date of 20 days after filing as adopted with the Texas Register. (Mr. Agosto was absent for the vote.)*

(ATTACHMENT 9, page 209)

17. Review of Absolute Return Asset Class
(Board agenda page III-99)

MOTION AND VOTE: *It was recommended by the Committee on School Finance/Permanent School Fund and carried unanimously by the State Board of Education to approve the issuance of a Request for Proposals for Absolute Return Discretionary Separate Account Fund-of-Funds Manager for the Permanent School Fund, as amended. (Mr. Craig and Mrs. Miller were absent for the vote.)*

COMMITTEE ON SCHOOL INITIATIVES

18. Review of Proposed Amendments to 19 TAC Chapter 245, Certification of Educators from Other Countries
(Board agenda page IV-1)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

19. Review of Proposed Repeal of 19 TAC Chapter 241, Principal Certificate, §241.35, Assessment Process Definition and Approval of Individual Assessments
(Board agenda page IV-11)

Action taken on this item by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

REPORTS OF COMMITTEES REGARDING AGENDA ITEMS ON COMMITTEE AGENDAS

Committee on Instruction

No report was presented.

Committee on School Finance/Permanent School Fund

No report was presented.

Committee on School Initiatives

No report was presented.

REPORTS OF OTHER STATE BOARD OF EDUCATION MEMBERS REGARDING AGENDA ITEMS AND EDUCATIONAL ACTIVITIES AND CONCERNS IN INDIVIDUAL DISTRICTS

No reports were presented.

The meeting adjourned at 7:20 p.m.

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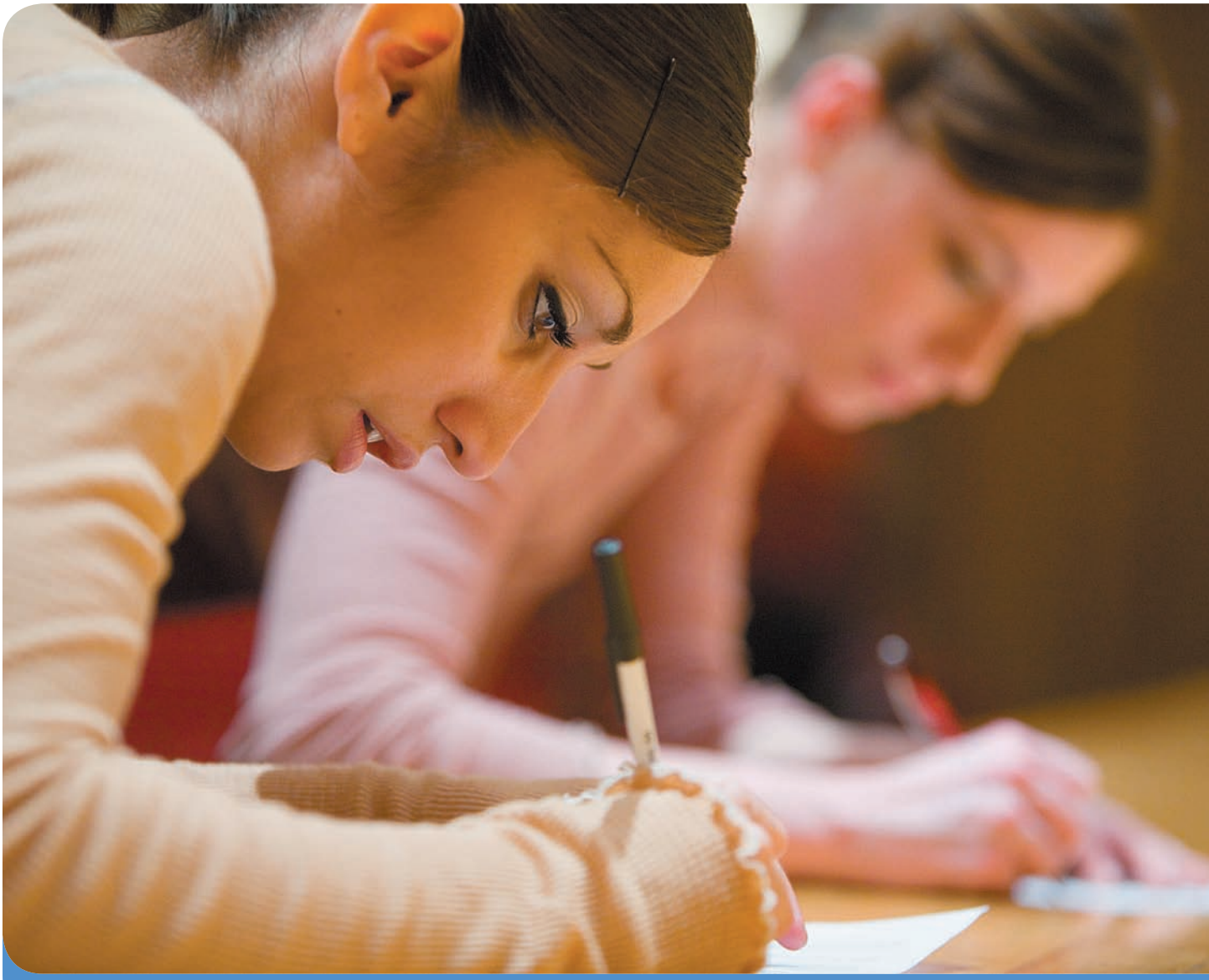
Terri Leo, Secretary

Attachment 4f

Texas College and Career Readiness Standards

Texas College and Career Readiness Standards



Texas College and Career Readiness Standards

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Introduction

Over the past decade, Texas has focused on ensuring that its students are prepared for a changing and increasingly complex future. In elementary and middle schools, test results have improved, especially among students of color, and more students of all backgrounds are entering and completing postsecondary education programs. However, despite these substantial gains, Texas trails other states in preparing and sending students to postsecondary education. It is also clear that K-12 students, along with their parents, are uncertain about what students must know and what intellectual skills they must possess to be successful beyond high school.

Recognizing the importance of a world class education, the 79th Texas Legislature, Third Called Special Session, passed House Bill 1, the "Advancement of College Readiness in Curriculum." Section 28.008 of the Texas Education Code, seeks to increase the number of students who are college and career ready when they graduate high school. The legislation required the Texas Education Agency (TEA) and the Texas Higher Education Coordinating Board (THECB) to establish Vertical Teams (VTs) to develop College and Career Readiness Standards (CCRS) in the areas of English/language arts, mathematics, science, and social studies. These standards specify what students must know and be able to do to succeed in entry-level courses at postsecondary institutions in Texas.

Vertical Teams were composed of secondary and postsecondary faculty. In 2007, the VTs met in February, March, June, and August and developed draft standards to present to the THECB. At its October 2007 meeting, Board members approved posting of the draft standards for public comment. Over 1500 comments were received and were reviewed by the VTs as they prepared their final drafts. The final drafts were submitted to the Commissioner of Higher Education who presented them to the THECB for adoption at its January 2008 meeting. The CCRS were approved unanimously and sent to the Commissioner of Education and the State Board of Education for incorporation into the Texas Essential Knowledge and Skills (TEKS).

The Nature of College and Career Readiness Standards

In developing the CCRS, the VTs set out to specify the knowledge and skills necessary to succeed in entry-level community college and university courses. The CCRS serve a different purpose than high school graduation standards, which typically emphasize mastery of basic skills and knowledge, and not necessarily college and career readiness. High school courses are designed to provide a broad set of core knowledge and skills and a foundation in literacy and basic mathematics. College courses typically require students to use content knowledge to weigh and analyze important issues and questions in a field of study. Even a high-quality college-preparatory curriculum is unlikely to prepare students to pursue a specific major in college. It can, however, help students develop a foundation of skills that they can employ to successfully pursue a variety of college majors. Therefore, the CCRS distinguish themselves from high school standards by emphasizing content knowledge as a means to an end: the content stimulates students to engage in deeper levels of thinking.

The CCRS are designed to represent a full range of knowledge and skills that students need to succeed in entry-level college courses, as well as in a wide range of majors and careers. According to research, over 80 percent of 21st century jobs require some postsecondary education. By implementing these standards, secondary school and postsecondary faculty in all academic disciplines will advance the mission of Texas: college and career ready students.

Organization of the College and Career Readiness Standards Framework

The CCRS consist of a multi-level framework that focuses not only on subject matter, but also on the way it is organized and presented in the classroom. This is crucial because at the postsecondary level, students need to understand the structure of the discipline and how knowledge expands from initial study of a topic. This pedagogical understanding sets a threshold for the kinds of deeper investigation and learning that occur as students pursue in-depth courses in their chosen majors.

Without an adequate understanding of the structure of their discipline, students will have difficulty succeeding in or will get less out of the upper-division courses that they will eventually take. The CCRS, therefore, introduce these disciplinary structures at the entry-level in order to familiarize students with key concepts and content in each of the four subject areas previously specified and in a set of cross-disciplinary standards.

Roman numerals mark the key content within each subject area. Capital letters specify the organizing components for introducing key knowledge and skills. Numbered headings delineate specific performance expectations regarding expected knowledge and skills and also suggest the challenge level of the standard. Lower-case letters present indicators of ways in which students would demonstrate performance in each area. These performance indicators, which are included as part of the appendix, serve as examples only and have not been adopted as policy by the THECB.

The CCRS should not be construed as a checklist. Generally, however, the more standards a student can demonstrate successfully, the more likely it is that he or she will be college and career ready. More importantly, that student will be prepared to succeed in most subject areas offered in college. Therefore, rather than superficially glossing over each standard, students will benefit from mastering them. The reader should keep an important distinction in mind when reviewing the CCRS: they avoid restating in detail all the prerequisite knowledge and skills that students must master to be college and career ready. The CCRS focus on "keystone" knowledge and skills. They depend on students achieving facility and fluency in foundation knowledge in the disciplines. They assume that students have achieved mastery of the knowledge and skills delineated in the TEKS. Establishing a clear connection between the TEKS and the CCRS is a crucial component of system alignment that will result in more students being ready for college.

The final section of the CCRS contains cross-disciplinary, foundational cognitive skills that may be as important as any particular content knowledge. Some of these skills, such as problem solving, are also contained within specific subject areas, but they are given additional emphasis by their inclusion in the separate cross-disciplinary standards section. Research on entry-level college courses conducted with thousands of college instructors has confirmed both the importance of these skills in entry-level courses as well as the significant shortcomings entering students demonstrate in these areas.

"Generally, the more standards a student can demonstrate successfully, the more likely it is that he or she will be college and career ready."

One additional point should be made. In delineating the knowledge and skills necessary for college and career readiness, the CCRS do not specify the performance levels necessary to demonstrate competence. Without examples of course syllabi, assignments, and student work to illustrate when or how a standard is met, some standards could conceivably be interpreted to be at a level that would challenge graduate students. Obviously, this is not the intent of the CCRS. The expectations inherent in each standard are keyed to what high school students can be expected to accomplish by the time they complete high school. Examples of course material that illustrate the necessary performance level for each standard will be made available as the CCRS are implemented.

In developing these standards, members of the VTs and staff at the TEA and the THECB were fully aware that not all high school graduates plan to go to college. However, a survey of the research on readiness for entry into the skilled workforce makes it clear that employers want their employees to be able

to read and communicate well, to perform relatively complex mathematical calculations accurately, to possess a strong knowledge of basic science, to have a fundamental knowledge of American culture and the world beyond, and to be able to think critically and adjust to rapidly changing work environments. Because these college and career readiness standards focus precisely on a strong foundation of knowledge and intellectual skills, including intellectual nimbleness and adaptability, they will serve equally well those students heading to college and to the workforce.

Organization of the College and Career Readiness Standards

The goal of the Texas CCRS is to establish what students must know and be able to do to succeed in entry-level courses offered at institutions of higher education. These CCRS are organized into four levels of specificity. The levels are defined and will appear as follows:

I. Key Content

A. Organizing Components

1. Performance Expectations

a. Examples of Performance Indicators

I. Key Content:

Keystone ideas of a discipline that reverberate as themes throughout the curriculum. (Designated by Roman numerals.)

A. Organizing Components:

Knowledge and subject areas that organize a discipline around what students should retain, be able to transfer, and apply to new knowledge and skills. (Designated by capital letters.)

1. Performance Expectations:
Knowledge and skills that represent important ideas of the current understanding of each organizing concept as well as the multiple contexts in which each organizing concept can be manifest. (Designated by numbers.)

EXAMPLE

a. Examples of Performance Indicators: Examples of how to assess and measure performance expectations. This list of indicators is not meant to be either EXHAUSTIVE or PRESCRIPTIVE. The operating premise is that the more of these or other similar indicators a student is successfully able to demonstrate, the greater the probability that the student will be prepared to succeed in college. (Designated by lowercase letters and shading in the appendix of this document.)

English/Language Arts Standards

ENGLISH/LANGUAGE ARTS STANDARDS

English as a Way of Knowing

Listening, speaking, writing, and reading are vehicles for communication. They enable people to express their thoughts and demonstrate what they have learned. In the past, students were taught specific lessons under the rubric of language, and the skills were practiced, reinforced, and analyzed throughout the day in subjects such as geography, history, and science. Today the teaching of language arts is often considered the exclusive responsibility of English teachers. However, the complex role of language in education makes it clear that the language arts cannot be left entirely to the English class. Improvement in the language arts requires students to read and write frequently in all disciplines and to receive ample feedback. Following these standards, the language arts should be viewed as being fundamental to pedagogy in any subject.

English teachers have the expertise to ask, explore, and help students answer fundamental questions about language, among them:

- How does one convey a message in writing?
- What genres are most suitable in a given context, and what are the textual features of those genres?
- What is Standard American English?
- How might one become a more skillful reader who can understand both the text's surface and deeper meanings?
- What shared and unique features characterize specific literary genres?
- What are significant texts in American, British, and world literature, and what might they reveal about their cultural and historical contexts?
- What are the characteristics of effective listening and speaking, and how might one acquire and improve them?

English is mastered in the context of challenging content that requires students to think deeply and to exercise discipline in order to demonstrate understanding, raise questions, and present ideas.

Understanding and Using These Standards

Vertical Team (VT) members reviewed research on the skills and content knowledge students need to succeed in college; they also examined exemplary College and Career Readiness Standards (CCRS) and state and national standards in English. As members of the Commission for a College and Career Ready Texas (CCRT), the VT co-chairs studied reports and heard expert testimony. The VT's first draft was posted for public comment in October 2007 by the Texas Higher Education Coordinating Board (THECB). Concurrently, the VTs revised the standards in response to feedback from the CCRT, and this second draft was incorporated into the Report of the CCRT. The standards adopted by the THECB incorporate revisions based on the feedback to both public documents.

These standards are designed to be straightforward and easy to read. The VT members sought to avoid redundancy, wordiness, or specialized terminology. The danger with this approach is that even though each statement may be simple, the underlying meaning may not. The mastery level necessary on any particular standard depends on the specific task faced by the student. In other words, the standards can be fully understood only in the context of the learning materials or assignments with which the student is presented.

In this document, the rules of Standard American English are embedded into the writing process because a student must use language correctly in order to be college and career ready. For example, it would be highly unusual for a student to be given a multiple-choice test on parts of speech in a first-year English class in college. These rules are also contained in the cross-disciplinary standards to indicate the need for students to be able to use grammar and punctuation correctly in all subject areas. Another reason that mechanics and usage are not separated from the writing process is that the context of communication—what educators and scholars call the rhetorical situation—determines what is appropriate and what is effective. Because language is employed in a wide range of situations, skillful users of language must know how to

interpret and express themselves in a variety of forms and formats. Therefore, the standards address the full range of American English, allowing for the possibility that language can be used appropriately in many different formats and that students must have mastery of the rules associated with those formats and know when and how to apply those rules.

Because the language arts are present throughout the core curriculum, standards for the language arts appear in two places in this document—as elements of the cross-disciplinary standards fundamental to all subjects and as a stand-alone subject.

I. Writing

A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose.

1. Determine effective approaches, forms, and rhetorical techniques that demonstrate understanding of the writer's purpose and audience.

2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.
3. Evaluate relevance, quality, sufficiency, and depth of preliminary ideas and information, organize material generated, and formulate a thesis.
4. Recognize the importance of revision as the key to effective writing. Each draft should refine key ideas and organize them more logically and fluidly, use language more precisely and effectively, and draw the reader to the author's purpose.
5. Edit writing for proper voice, tense, and syntax, assuring that it conforms to standard English, when appropriate.

II. Reading

A. Locate explicit textual information, draw complex inferences, and analyze and evaluate the information within and across texts of varying lengths.

1. Use effective reading strategies to determine a written work's purpose and intended audience.
2. Use text features and graphics to form an overview of informational texts and to determine where to locate information.
3. Identify explicit and implicit textual information including main ideas and author's purpose.
4. Draw and support complex inferences from text to summarize, draw conclusions, and distinguish facts from simple assertions and opinions.
5. Analyze the presentation of information and the strength and quality of evidence used by the author, and judge the coherence and logic of the presentation and the credibility of an argument.
6. Analyze imagery in literary texts.
7. Evaluate the use of both literal and figurative language to inform and shape the perceptions of readers.
8. Compare and analyze how generic features are used across texts.

9. Identify and analyze the audience, purpose, and message of an informational or persuasive text.
10. Identify and analyze how an author's use of language appeals to the senses, creates imagery, and suggests mood.
11. Identify, analyze, and evaluate similarities and differences in how multiple texts present information, argue a position, or relate a theme.

B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.
2. Apply knowledge of roots and affixes to infer the meanings of new words.
3. Use reference guides to confirm the meanings of new words or concepts.

C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods.

1. Read a wide variety of texts from American, European, and world literatures.
2. Analyze themes, structures, and elements of myths, traditional narratives, and classical and contemporary literature.
3. Analyze works of literature for what they suggest about the historical period and cultural contexts in which they were written.
4. Analyze and compare the use of language in literary works from a variety of world cultures.

D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances.

1. Describe insights gained about oneself, others, or the world from reading specific texts.
2. Analyze the influence of myths, folktales, fables, and classical literature from a variety of world cultures on later literature and film.

III. Speaking

A. Understand the elements of communication both in informal group discussions and formal presentations (e.g., accuracy, relevance, rhetorical features, organization of information).

1. Understand how style and content of spoken language varies in different contexts and influences the listener's understanding.
2. Adjust presentation (delivery, vocabulary, length) to particular audiences and purposes.

B. Develop effective speaking styles for both group and one-on-one situations.

1. Participate actively and effectively in one-on-one oral communication situations.
2. Participate actively and effectively in group discussions.
3. Plan and deliver focused and coherent presentations that convey clear and distinct perspectives and demonstrate solid reasoning.

IV. Listening

A. Apply listening skills as an individual and as a member of a group in a variety of settings (e.g., lectures, discussions, conversations, team projects, presentations, interviews).

1. Analyze and evaluate the effectiveness of a public presentation.
2. Interpret a speaker's message; identify the position taken and the evidence in support of that position.
3. Use a variety of strategies to enhance listening comprehension (e.g., focus attention on message, monitor message for clarity and understanding, provide verbal and nonverbal feedback, note cues such as change of pace or particular words that indicate a new point is about to be made, select and organize key information).

B. Listen effectively in informal and formal situations.

1. Listen critically and respond appropriately to presentations.
2. Listen actively and effectively in one-on-one communication situations.
3. Listen actively and effectively in group discussions.

V. Research

A. Formulate topic and questions.

1. Formulate research questions.
2. Explore a research topic.
3. Refine research topic and devise a timeline for completing work.

B. Select information from a variety of sources.

1. Gather relevant sources.
2. Evaluate the validity and reliability of sources.
3. Synthesize and organize information effectively.

C. Produce and design a document.

1. Design and present an effective product.
2. Use source material ethically.

Mathematics Standards

MATHEMATICS STANDARDS

Mathematics as a Way of Knowing

Mathematics knowledge is essential to becoming a productive citizen in today's society. Many factors have increased the level of understanding of mathematics needed by the average adult. Our ever-changing world has become increasingly quantitative in nature. For example, in the physical sciences, social studies, and the business world, a widening array of phenomena is explained with numeric data presented visually in the form of charts and graphs that require interpretation. Mathematical reasoning is key to solving problems, formulating logical arguments, understanding quantitative features of various disciplines, critically analyzing media sources, and searching for patterns. Through mathematics, people become more able to make well-informed decisions by formulating conjectures and testing hypotheses. Mathematics cannot be viewed solely as a series of stand-alone courses or a set of specific skills. It must also be considered as a source of cross-disciplinary knowledge that is essential for success in numerous areas of study.

Understanding and Using These Standards

The College and Career Readiness Standards (CCRS) were developed as a result of a collaborative effort between secondary and postsecondary faculty. The standards are not intended to prescribe specific high school mathematics course titles or to endorse particular sequences. Students may encounter some of the content included in these standards at lower levels and should aim to meet these standards in high school.

These CCRS are designed to help students, parents, teachers, and counselors understand the specific content knowledge and academic skills necessary for college and career readiness. This knowledge enables all stakeholders to determine if the challenge level of any given mathematics course is appropriate to prepare students for college and careers. The CCRS are broad in nature, equipping students for general education college mathematics courses, but are not intended to encompass all skills necessary for students entering majors that require specific mathematical knowledge.

"Students who enter college having mastered these standards are likely to be successful in entry-level college mathematics courses and to be prepared for courses in related disciplines that require mathematical proficiency."

Students who enter college having mastered these standards are likely to be successful in entry-level college mathematics courses and to be prepared for courses in related disciplines that require mathematical proficiency. For science, technology, engineering, and mathematics majors in particular, additional mathematical knowledge and skills will be necessary, although adequate foundation for these future studies would be established.

Some standards identify specific mathematical skills and knowledge. Some are specific to subject area topics, while others address global topics. All are viewed as equally important to achieving the level of mathematical proficiency necessary for college and career readiness. In addition, students must develop ways of thinking about mathematics. These key cognitive skills elevate mathematics from an exercise in rote memorization to a process of analysis and interpretation that enables the learner to work with a range of complex questions, topics, and issues. The standards contain frequent reference to these key cognitive skills, but always in the context of challenging and appropriate content knowledge. Mathematical thinking never occurs in a vacuum; it is always embedded in appropriate content.

The use of technology is an instructional decision that facilitates the learning of mathematical concepts and processes. The Vertical Team decided to allow instructors to determine when and how to use technology based on their students' needs, the instructional resources, and the learning expectation. The growing technological world we live in requires students to embrace technology and the constant changes it brings to daily life.

I. Numeric Reasoning

A. Number representation

1. Compare real numbers.
2. Define and give examples of complex numbers.

B. Number operations

1. Perform computations with real and complex numbers.

C. Number sense and number concepts

1. Use estimation to check for errors and reasonableness of solutions.

II. Algebraic Reasoning

A. Expressions and equations

1. Explain and differentiate between expressions and equations using words such as "solve," "evaluate," and "simplify."

B. Manipulating expressions

1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions).

C. Solving equations, inequalities, and systems of equations

1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.
2. Explain the difference between the solution set of an equation and the solution set of an inequality.

D. Representations

1. Interpret multiple representations of equations and relationships.
2. Translate among multiple representations of equations and relationships.

III. Geometric Reasoning

A. Figures and their properties

1. Identify and represent the features of plane and space figures.
2. Make, test, and use conjectures about one-, two-, and three-dimensional figures and their properties.
3. Recognize and apply right triangle relationships including basic trigonometry.

B. Transformations and symmetry

1. Identify and apply transformations to figures.
2. Identify the symmetries of a plane figure.
3. Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures.

C. Connections between geometry and other mathematical content strands

1. Make connections between geometry and algebra.
2. Make connections between geometry, statistics, and probability.
3. Make connections between geometry and measurement.

D. Logic and reasoning in geometry

1. Make and validate geometric conjectures.
2. Understand that Euclidean geometry is an axiomatic system.

IV. Measurement Reasoning

A. Measurement involving physical and natural attributes

1. Select or use the appropriate type of unit for the attribute being measured.

B. Systems of measurement

1. Convert from one measurement system to another.
2. Convert within a single measurement system.

C. Measurement involving geometry and algebra

1. Find the perimeter and area of two-dimensional figures.
2. Determine the surface area and volume of three-dimensional figures.
3. Determine indirect measurements of figures using scale drawings, similar figures, the Pythagorean Theorem, and basic trigonometry.

D. Measurement involving statistics and probability

1. Compute and use measures of center and spread to describe data.
2. Apply probabilistic measures to practical situations to make an informed decision.

V. Probabilistic Reasoning

A. Counting principles

1. Determine the nature and the number of elements in a finite sample space.

B. Computation and interpretation of probabilities

1. Compute and interpret the probability of an event and its complement.
2. Compute and interpret the probability of conditional and compound events.

VI. Statistical Reasoning

A. Data collection

1. Plan a study.

B. Describe data

1. Determine types of data.
2. Select and apply appropriate visual representations of data.
3. Compute and describe summary statistics of data.
4. Describe patterns and departure from patterns in a set of data.

C. Read, analyze, interpret, and draw conclusions from data

1. Make predictions and draw inferences using summary statistics.
2. Analyze data sets using graphs and summary statistics.
3. Analyze relationships between paired data using spreadsheets, graphing calculators, or statistical software.
4. Recognize reliability of statistical results.

VII. Functions

A. Recognition and representation of functions

1. Recognize whether a relation is a function.
2. Recognize and distinguish between different types of functions.

B. Analysis of functions

1. Understand and analyze features of a function.
2. Algebraically construct and analyze new functions.

C. Model real world situations with functions

1. Apply known function models.
2. Develop a function to model a situation.

VIII. Problem Solving and Reasoning

A. Mathematical problem solving

1. Analyze given information.
2. Formulate a plan or strategy.
3. Determine a solution.
4. Justify the solution.
5. Evaluate the problem-solving process.

B. Logical reasoning

1. Develop and evaluate convincing arguments.
2. Use various types of reasoning.

C. Real world problem solving

1. Formulate a solution to a real world situation based on the solution to a mathematical problem.
2. Use a function to model a real world situation.
3. Evaluate the problem-solving process.

IX. Communication and Representation

A. Language, terms, and symbols of mathematics

1. Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem.
2. Use mathematical language to represent and communicate the mathematical concepts in a problem.
3. Use mathematics as a language for reasoning, problem solving, making connections, and generalizing.

B. Interpretation of mathematical work

1. Model and interpret mathematical ideas and concepts using multiple representations.
2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context.

C. Presentation and representation of mathematical work

1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words.
2. Create and use representations to organize, record, and communicate mathematical ideas.
3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.

X. Connections

A. Connections among the strands of mathematics

1. Connect and use multiple strands of mathematics in situations and problems.
2. Connect mathematics to the study of other disciplines.

B. Connections of mathematics to nature, real world situations, and everyday life

1. Use multiple representations to demonstrate links between mathematical and real world situations.
2. Understand and use appropriate mathematical models in the natural, physical, and social sciences.
3. Know and understand the use of mathematics in a variety of careers and professions.

Science Standards

Science as a Way of Knowing

As with mathematics, proficiency in science needs to improve before and during the secondary school years in order to meet the test of college and career readiness. The process of science rests on information and descriptions about the natural world, collected by observation. When an observation has been made repeatedly and independently by several observers under controlled and reproducible conditions, the findings are regarded with increasing confidence. Findings that are repeatedly confirmed across a range of situations yield insights that can lead to explanatory models, also called theories. Throughout this process, certain analytical procedures and practices are used in all scientific disciplines. These include specific mathematical procedures and techniques, standardized measurement methods, and several applications of formal logic.

These logical procedures are extremely important components of scientific methods but are not usually spontaneous, intuitive modes of thought. Scientific methods emphasize the practice of testing hypotheses (i.e., theories, explanatory models) by comparing their predictions to observations of the natural world. To judge the quality of a hypothesis, scientists ask whether it leads to accurate predictions about future events or observations. This pattern of logical thought and this particular method of analyzing and improving our understanding of the natural world is a fundamental element of all studies of science.

The field of science is typically divided into disciplines such as biology, chemistry, physics, environmental science, and Earth science. Although each discipline focuses on different features of the natural world, all areas of science share a common set of principles and procedures for collecting, analyzing, evaluating, and synthesizing information.

Science is distinguished from other fields of study by the way students learn skills for appropriately applying a variety of apparatuses, equipment, techniques, and procedures for collecting, interpreting, and using data. While engaged in scientific inquiry, students utilize other foundational skills such as mathematics, communication, and social ethics, as well as personal skills such as time management, self-discipline, and organization.

"The standards are focused on ensuring that students are ready to explore and appreciate the richness and complexity of the natural world..."

Understanding and Using These Standards

The science Vertical Team (VT) consulted a range of resource materials that contained standards for science developed by national subject matter organizations, and considered carefully other the college readiness standards in science that have been previously developed. In addition, the process drew from various VT member experiences and backgrounds in order to respond to the needs and situations of Texas schools.

The standards are focused on ensuring that students are ready to explore and appreciate the richness and complexity of the natural world, to grapple with new ideas and divergent interpretations, and to master the powerful techniques of collecting, organizing, and analyzing information that scientists use in their investigations. The standards go beyond the three "traditional" high school science courses of biology, chemistry, and physics. They are less

concerned with course titles and more focused on ensuring that students are ready to explore and appreciate the richness and complexity of the natural world.

Although the standards are quite extensive and specific in their identification of important prerequisite knowledge, they emphasize in equal measure the importance of the key cognitive skills necessary to succeed in the kinds of tasks that students will almost certainly encounter in entry-level college science courses.

Student success in college-level introductory science courses depends on the development of certain skills in high school classes. Although applications of these skills vary from one discipline and one grade level to the next, all high school science courses should encourage students to master in an age-appropriate manner the concepts and vocabulary outlined in the standards, and to do so while acquiring and developing the key cognitive skills necessary to think like a scientist.

Within the context of these standards, scientific vocabulary should be viewed as a tool, not as an end in itself. Technical words and phrases allow concise and precise communication. Accurate use of technical language is critical for interaction among those who are actively engaged in science. But to focus on vocabulary alone is not sufficient. Students should be encouraged to maintain a judicious balance between learning vocabulary and applying that vocabulary as they formulate good questions, plan investigations, gather and evaluate data, and draw conclusions.

I. Nature of Science: Scientific Ways of Learning and Thinking

A. Cognitive skills in science

1. Utilize skepticism, logic, and professional ethics in science.
2. Use creativity and insight to recognize and describe patterns in natural phenomena.
3. Formulate appropriate questions to test understanding of natural phenomena.
4. Rely on reproducible observations of empirical evidence when constructing, analyzing, and evaluating explanations of natural events and processes.

B. Scientific inquiry

1. Design and conduct scientific investigations in which hypotheses are formulated and tested.

C. Collaborative and safe working practices

1. Collaborate on joint projects.
2. Understand and apply safe procedures in the laboratory and field, including chemical, electrical, and fire safety and safe handling of live or preserved organisms.
3. Demonstrate skill in the safe use of a wide variety of apparatuses, equipment, techniques, and procedures.

D. Current scientific technology

1. Demonstrate literacy in computer use.
2. Use computer models, applications, and simulations.
3. Demonstrate appropriate use of a wide variety of apparatuses, equipment, techniques, and procedures for collecting quantitative and qualitative data.

E. Effective communication of scientific information

1. Use several modes of expression to describe or characterize natural patterns and phenomena. These modes of expression include narrative, numerical, graphical, pictorial, symbolic, and kinesthetic.
2. Use essential vocabulary of the discipline being studied.

II. Foundation Skills: Scientific Applications of Mathematics

A. Basic mathematics conventions

1. Understand the real number system and its properties.
2. Use exponents and scientific notation.
3. Understand ratios, proportions, percentages, and decimal fractions, and translate from any form to any other.
4. Use proportional reasoning to solve problems.
5. Simplify algebraic expressions.
6. Estimate results to evaluate whether a calculated result is reasonable.
7. Use calculators, spreadsheets, computers, etc., in data analysis.

B. Mathematics as a symbolic language

1. Carry out formal operations using standard algebraic symbols and formulae.
2. Represent natural events, processes, and relationships with algebraic expressions and algorithms.

C. Understand relationships among geometry, algebra, and trigonometry

1. Understand simple vectors, vector notations, and vector diagrams, and carry out simple calculations involving vectors.
2. Understand that a curve drawn on a defined set of axes is fully equivalent to a set of algebraic equations.
3. Understand basic trigonometric principles, including definitions of terms such as sine, cosine, tangent, cotangent, and their relationship to triangles.
4. Understand basic geometric principles.

D. Scientific problem solving

1. Use dimensional analysis in problem solving.

E. Scientific application of probability and statistics

1. Understand descriptive statistics.

F. Scientific measurement

1. Select and use appropriate Standard International (SI) units and prefixes to express measurements for real world problems.
2. Use appropriate significant digits.
3. Understand and use logarithmic notation (base 10).

III. Foundation Skills: Scientific Applications of Communication

A. Scientific writing

1. Use correct applications of writing practices in scientific communication.

B. Scientific reading

1. Read technical and scientific articles to gain understanding of interpretations, apparatuses, techniques or procedures, and data.
2. Set up apparatuses, carry out procedures, and collect specified data from a given set of appropriate instructions.
3. Recognize scientific and technical vocabulary in the field of study and use this vocabulary to enhance clarity of communication.
4. List, use, and give examples of specific strategies before, during, and after reading to improve comprehension.

C. Presentation of scientific/technical information

1. Prepare and present scientific/technical information in appropriate formats for various audiences.

D. Research skills/information literacy

1. Use search engines, databases, and other digital electronic tools effectively to locate information.
2. Evaluate quality, accuracy, completeness, reliability, and currency of information from any source.

IV. Science, Technology, and Society

A. Interactions between innovations and science

1. Recognize how scientific discoveries are connected to technological innovations.

B. Social ethics

1. Understand how scientific research and technology have an impact on ethical and legal practices.
2. Understand how commonly held ethical beliefs impact scientific research.

C. History of science

1. Understand the historical development of major theories in science.
2. Recognize the role of people in important contributions to scientific knowledge.

V. Cross-Disciplinary Themes

A. Matter/states of matter

1. Know modern theories of atomic structure.
2. Understand the typical states of matter (solid, liquid, gas) and phase changes among these.

B. Energy (thermodynamics, kinetic, potential, energy transfers)

1. Understand the Laws of Thermodynamics.
2. Know the processes of energy transfer.

C. Change over time/equilibrium

1. Recognize patterns of change.

D. Classification

1. Understand that scientists categorize things according to similarities and differences.

E. Measurements and models

1. Use models to make predictions.
2. Use scale to relate models and structures.
3. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.

VI. Biology

A. Structure and function of cells

1. Know that although all cells share basic features, cells differentiate to carry out specialized functions.
2. Explain how cells can be categorized into two major types: prokaryotic and eukaryotic, and describe major features that distinguish one from the other.
3. Describe the structure and function of major sub-cellular organelles.
4. Describe the major features of mitosis and relate this process to growth and asexual reproduction.
5. Understand the process of cytokinesis in plant and animal cells and how this process is related to growth.
6. Know the structure of membranes and how this relates to permeability.

B. Biochemistry

1. Understand the major categories of biological molecules: lipids, carbohydrates, proteins, and nucleic acids.
2. Describe the structure and function of enzymes.
3. Describe the major features and chemical events of photosynthesis.
4. Describe the major features and chemical events of cellular respiration.
5. Know how organisms respond to presence or absence of oxygen, including mechanisms of fermentation.

6. Understand coupled reaction processes and describe the role of ATP in energy coupling and transfer.

C. Evolution and populations

1. Know multiple categories of evidence for evolutionary change and how this evidence is used to infer evolutionary relationships among organisms.
2. Recognize variations in population sizes, including extinction, and describe mechanisms and conditions that produce these variations.

D. Molecular genetics and heredity

1. Understand Mendel's laws of inheritance.
2. Know modifications to Mendel's laws.
3. Understand the molecular structures and functions of nucleic acids.
4. Understand simple principles of population genetics and describe characteristics of a Hardy-Weinberg population.
5. Describe the major features of meiosis and relate this process to Mendel's laws of inheritance.

E. Classification and taxonomy

1. Know ways in which living things can be classified based on each organism's internal and external structure, development, and relatedness of DNA sequences.

F. Systems and homeostasis

1. Know that organisms possess various structures and processes (feedback loops) that maintain steady internal conditions.
2. Describe, compare, and contrast structures and processes that allow gas exchange, nutrient uptake and processing, waste excretion, nervous and hormonal regulation, and reproduction in plants, animals, and fungi; give examples of each.

G. Ecology

1. Identify Earth's major biomes, giving their locations, typical climate conditions, and characteristic organisms.
2. Know patterns of energy flow and material cycling in Earth's ecosystems.
3. Understand typical forms of organismal behavior.
4. Know the process of succession.

VII. Chemistry

A. Matter and its properties

1. Know that physical and chemical properties can be used to describe and classify matter.
2. Recognize and classify pure substances (elements, compounds) and mixtures.

B. Atomic structure

1. Summarize the development of atomic theory. Understand that models of the atom are used to help understand the properties of elements and compounds.

C. Periodic table

1. Know the organization of the periodic table.
2. Recognize the trends in physical and chemical properties as one moves across a period or vertically through a group.

D. Chemical bonding

1. Characterize ionic bonds, metallic bonds, and covalent bonds. Describe the properties of metals and ionic and covalent compounds.

E. Chemical reactions

1. Classify chemical reactions by type. Describe the evidence that a chemical reaction has occurred.
2. Describe the properties of acids and bases, and identify the products of a neutralization reaction.
3. Understand oxidation-reduction reactions.
4. Understand chemical equilibrium.
5. Understand energy changes in chemical reactions.
6. Understand chemical kinetics.

F. Chemical nomenclature

1. Know formulas for ionic compounds.
2. Know formulas for molecular compounds.

G. The mole and stoichiometry

1. Understand the mole concept.
2. Understand molar relationships in reactions, stoichiometric calculations, and percent yield.

H. Thermochemistry

1. Understand the Law of Conservation of Energy and processes of heat transfer.
2. Understand energy changes and chemical reactions.

I. Properties and behavior of gases, liquids, and solids

1. Understand the behavior of matter in its various states: solid, liquid, and gas.
2. Understand properties of solutions.
3. Understand principles of ideal gas behavior and kinetic molecular theory.
4. Apply the concept of partial pressures in a mixture of gases.
5. Know properties of liquids and solids.
6. Understand the effect of vapor pressure on changes in state; explain heating curves and phase diagrams.
7. Describe intermolecular forces.

J. Basic structure and function of biological molecules: proteins, carbohydrates, lipids, and nucleic acids

1. Understand the major categories of biological molecules: proteins, carbohydrates, lipids, and nucleic acids.

K. Nuclear chemistry

1. Understand radioactive decay.

VIII. Physics

A. Matter

1. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.
2. Understand states of matter and their characteristics.
3. Understand the concepts of mass and inertia.
4. Understand the concept of density.
5. Understand the concepts of gravitational force and weight.

B. Vectors

1. Understand how vectors are used to represent physical quantities.
2. Demonstrate knowledge of vector mathematics using a graphical representation.
3. Demonstrate knowledge of vector mathematics using a numerical representation.

C. Forces and motion

1. Understand the fundamental concepts of kinematics.
2. Understand forces and Newton's Laws.
3. Understand the concept of momentum.

D. Mechanical energy

1. Understand potential and kinetic energy.
2. Understand conservation of energy.
3. Understand the relationship of work and mechanical energy.

E. Rotating systems

1. Understand rotational kinematics.
2. Understand the concept of torque.
3. Apply the concept of static equilibrium.
4. Understand angular momentum.

F. Fluids

1. Understand pressure in a fluid and its applications.
2. Understand Pascal's Principle.
3. Understand buoyancy.
4. Understand Bernoulli's principle.

G. Oscillations and waves

1. Understand basic oscillatory motion and simple harmonic motion.
2. Understand the difference between transverse and longitudinal waves.
3. Understand wave terminology: wavelength, period, frequency, and amplitude.

4. Understand the properties and behavior of sound waves.

H. Thermodynamics

1. Understand the gain and loss of heat energy in matter.
2. Understand the basic laws of thermodynamics.

I. Electromagnetism

1. Discuss electric charge and electric force.
2. Gain qualitative and quantitative understandings of voltage, current, and resistance.
3. Understand Ohm's Law.
4. Apply the concept of power to electricity.
5. Discuss basic DC circuits that include voltage sources and combinations of resistors.
6. Discuss basic DC circuits that include voltage sources and combinations of capacitors.
7. Understand magnetic fields and their relationship to electricity.
8. Relate electricity and magnetism to everyday life.

J. Optics

1. Know the electromagnetic spectrum.
2. Understand the wave/particle duality of light.
3. Understand concepts of geometric optics.

IX. Earth and Space Sciences

A. Earth systems

1. Know the major features and characteristics of atmosphere, geosphere, hydrosphere, and biosphere.
2. Understand relationships and interactions among atmosphere, geosphere, hydrosphere, and biosphere.
3. Possess a scientific understanding of the history of Earth's systems.
4. Utilize the tools scientists use to study and understand the Earth's systems.

B. Sun, Earth, and moon system

1. Understand interactions among the sun, Earth, and moon.
2. Possess a scientific understanding of the formation of the Earth and moon.

C. Solar system

1. Describe the structure and motions of the solar system and its components.
2. Possess a scientific understanding of the formation of the solar system.

D. Origin and structure of the universe

1. Understand scientific theories for the formation of the universe.
2. Know the current scientific descriptions of the components of the universe.

E. Plate tectonics

1. Describe the evidence that supports the current theory of plate tectonics.
2. Identify the major tectonic plates.
3. Describe the motions and interactions of tectonic plates.
4. Describe the rock cycle and its products.

F. Energy transfer within and among systems

1. Describe matter and energy transfer in the Earth's systems.
2. Give examples of effects of energy transfer within and among systems.

X. Environmental Science

A. Earth systems

1. Recognize the Earth's systems.
2. Know the major features of the geosphere and the factors that modify them.
3. Know the major features of the atmosphere.
4. Know the major features of the hydrosphere.
5. Be familiar with Earth's major biomes.
6. Describe the Earth's major biogeochemical cycles.

B. Energy

1. Understand energy transformations.

2. Know the various sources of energy for humans and other biological systems.

C. Populations

1. Recognize variations in population sizes, including human population and extinction, and describe mechanisms and conditions that produce these variations.

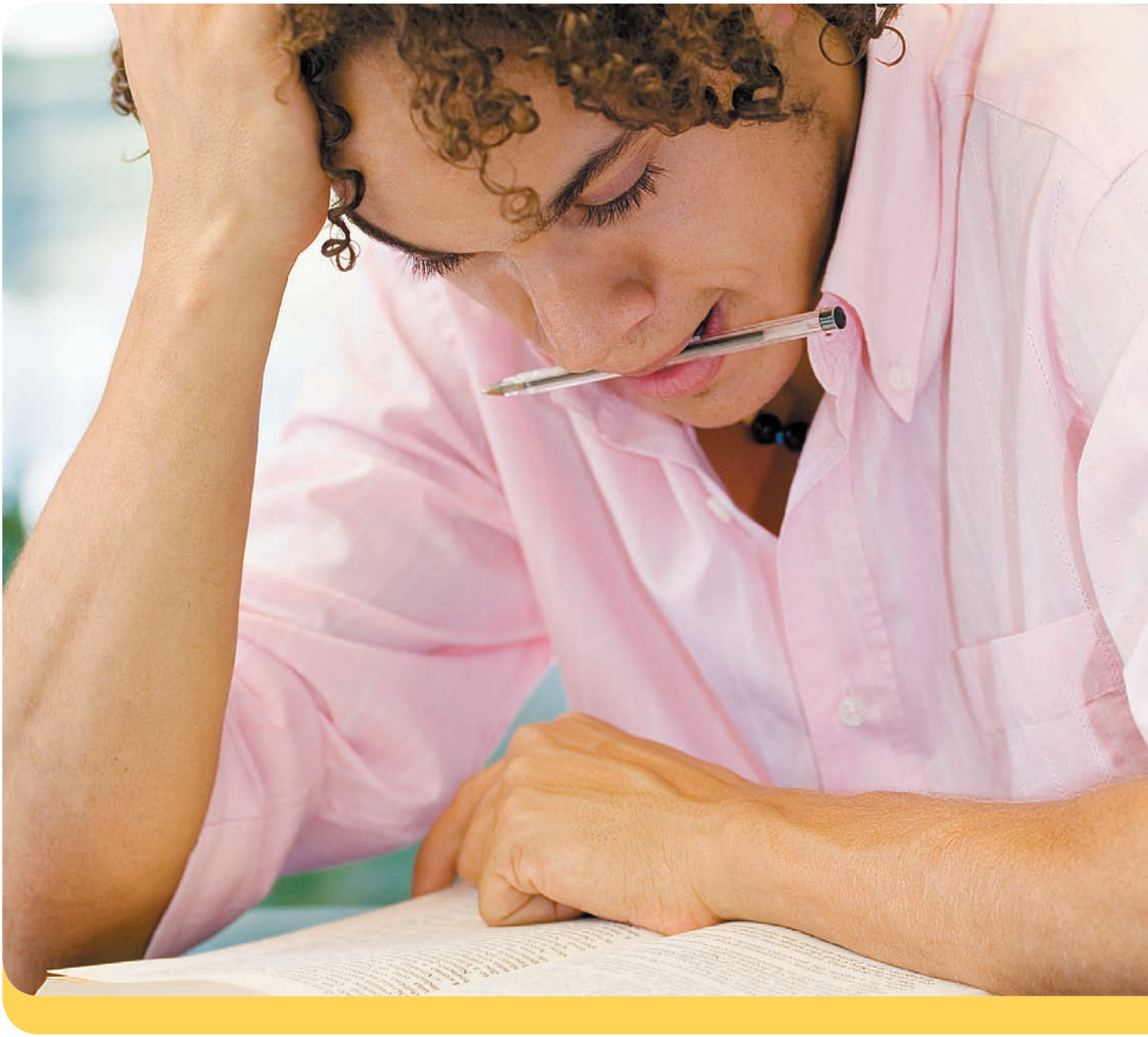
D. Economics and politics

1. Name and describe major environmental policies and legislation.
2. Understand the types, uses, and regulations of the various natural resources.

E. Human practices and their impacts

1. Describe the different uses for land (land management).
2. Understand the use and consequences of pest management.
3. Know the different methods used to increase food production.
4. Understand land and water usage and management practices.
5. Understand how human practices affect air, water, and soil quality.

Social Studies Standards



SOCIAL STUDIES STANDARDS

Social Studies as a Way of Knowing

Social studies encompass a wide variety of disciplines including history, geography, political science, sociology, psychology, anthropology, economics, philosophy, and archeology as well as several fields of specialization within these broad categories. Each discipline focuses on specific aspects of the human experience and employs a variety of methodological approaches to study these phenomena. Within each field, social scientists incorporate research, statistical methods, and conclusions from other disciplines to strengthen their own mode of inquiry. All social scientists employ a variety of key cognitive skills from the sciences, mathematics, and language arts. They use an interdisciplinary approach to understanding human behavior, organizations, institutions, beliefs, and attitudes across time and space.

The goal and the focus of social studies is to promote a deeper and richer understanding of the human experience. Together, social studies disciplines impart particular knowledge and skills that equip students to engage actively, thoughtfully, and responsibly with their local, national, and international communities.

A primary goal of social studies is to promote greater civic awareness and responsibility. Effective citizenship requires knowledge of political and economic structures and institutions, methods of participation, and tools for problem solving. Social studies encourage rational and logic-based analysis of complex social problems using a variety of approaches, while recognizing and appreciating diverse human perspectives. They encourage individuals to understand social and environmental influences on their behavior and to connect their lives and decisions to the world around them, taking into consideration both past and present.

Understanding and Using These Standards

Social studies as taught at the college level require mastery of key cognitive skills that utilize a broad body of factual information and concepts. Simply memorizing facts and data is not sufficient to succeed in a college-level social studies course. These thinking processes are the method by which students develop a greater understanding of the historical, political, economical, geographical, social, and psychological forces that have shaped their lives and the world they live in. Students need to know how to read and examine information critically, to communicate conclusions effectively, and to gather cogent information that will help them understand problems they will encounter in a wide variety of disciplines and careers.

"The ability to be a thoughtful analyst and interpreter of social and human behavior and events is at the heart of what it takes to succeed in college social studies courses."

To succeed at the college level, students in social studies must possess a body of knowledge and skills that enable them to engage actively with complex material. They must understand and be able to apply in a systematic manner the fundamental concepts, approaches, and terminologies common to a range of social studies disciplines including history, geography, political science, economics, and sociology. While it is not necessary for high school students to take courses in all of these subject areas, they do need to understand something about the tools that scholars in these subject areas use to formulate ideas and

investigate major problems in their fields. The ability to be a thoughtful analyst and interpreter of social and human behavior and events is at the heart of what it takes to succeed in college social studies courses. Training to develop these sophisticated skills needs to begin early and be nurtured over many years, and students need to be ready to demonstrate them with some level of fluency in college courses. The standards are designed to provide insight into the knowledge and skills students should be mastering in high school to be better prepared for the challenge of college social studies courses.

The Vertical Teams (VTs) chose deliberately not to identify lists of facts that students must master to be ready for college. Of course, students should master a range of specific information about social systems and phenomena. The VTs created standards that assume students will use their understanding of events, social systems, and human behavior to develop greater insight into how the various parts fit together into a more unified whole and how seemingly contradictory explanations or points-of-view can be analyzed for greater understanding instead of simply taking sides. This perspective is supported by and consistent with the approach taken in many exemplary social studies standards from other states and national organizations that were reviewed in the process of developing these standards.

I. Interrelated Disciplines and Skills

A. Spatial analysis of physical and cultural processes that shape the human experience

1. Use the tools and concepts of geography appropriately and accurately.
2. Analyze the interaction between human communities and the environment.
3. Analyze how physical and cultural processes have shaped human communities over time.
4. Evaluate the causes and effects of human migration patterns over time.
5. Analyze how various cultural regions have changed over time.
6. Analyze the relationship between geography and the development of human communities.

B. Periodization and chronological reasoning

1. Examine how and why historians divide the past into eras.
2. Identify and evaluate sources and patterns of change and continuity across time and place.
3. Analyze causes and effects of major political, economic, and social changes in U.S. and world history.

C. Change and continuity of political ideologies, constitutions, and political behavior

1. Evaluate different governmental systems and functions.
2. Evaluate changes in the functions and structures of government across time.
3. Explain and analyze the importance of civic engagement.

D. Change and continuity of economic systems and processes

1. Identify and evaluate the strengths and weaknesses of different economic systems.
2. Analyze the basic functions and structures of international economics.

E. Change and continuity of social groups, civic organizations, institutions, and their interaction

1. Identify different social groups (e.g., clubs, religious organizations) and examine how they form and how and why they sustain themselves.
2. Define the concept of socialization and analyze the role socialization plays in human development and behavior.
3. Analyze how social institutions (e.g., marriage, family, churches, schools) function and meet the needs of society.
4. Identify and evaluate the sources and consequences of social conflict.

F. Problem-solving and decision-making skills

1. Use a variety of research and analytical tools to explore questions or issues thoroughly and fairly.
2. Analyze ethical issues in historical, cultural, and social contexts.

II. Diverse Human Perspectives and Experiences

A. Multicultural societies

1. Define a "multicultural society" and consider both the positive and negative qualities of multiculturalism.
2. Evaluate the experiences and contributions of diverse groups to multicultural societies.

B. Factors that influence personal and group identities (e.g., race, ethnicity, gender, nationality, institutional affiliations, socioeconomic status)

1. Explain and evaluate the concepts of race, ethnicity, and nationalism.
2. Explain and evaluate the concept of gender.
3. Analyze diverse religious concepts, structures, and institutions around the world.
4. Evaluate how major philosophical and intellectual concepts influence human behavior or identity.
5. Explain the concepts of socioeconomic status and stratification.
6. Analyze how individual and group identities are established and change over time.

III. Interdependence of Global Communities

A. Spatial understanding of global, regional, national, and local communities

1. Distinguish spatial patterns of human communities that exist between or within contemporary political boundaries.
2. Connect regional or local developments to global ones.
3. Analyze how and why diverse communities interact and become dependent on each other.

B. Global analysis

1. Apply social studies methodologies to compare societies and cultures.

IV. Analysis, Synthesis, and Evaluation of Information

A. Critical examination of texts, images, and other sources of information

1. Identify and analyze the main idea(s) and point(s)-of-view in sources.
2. Situate an informational source in its appropriate contexts (contemporary, historical, cultural).
3. Evaluate sources from multiple perspectives.
4. Understand the differences between a primary and secondary source and use each appropriately to conduct research and construct arguments.
5. Read narrative texts critically.
6. Read research data critically.

B. Research and methods

1. Use established research methodologies.
2. Explain how historians and other social scientists develop new and competing views of past phenomena.
3. Gather, organize, and display the results of data and research.
4. Identify and collect sources.

C. Critical listening

1. Understand and interpret presentations (e.g., speeches, lectures, informal presentations) critically.

D. Reaching conclusions

1. Construct a thesis that is supported by evidence.
2. Recognize and evaluate counter-arguments.

V. Effective Communication

A. Clear and coherent oral and writtencommunication

1. Use appropriate oral communication techniques depending on the context or nature of the interaction.
2. Use conventions of standard written English.

B. Academic integrity

1. Attribute ideas and information to source materials and authors.

Cross-Disciplinary Standards

CROSS-DISCIPLINARY STANDARDS

Foundations of Learning and Knowing

Although the College and Career Readiness Standards (CCRS) are organized into four distinct disciplinary areas, English/language arts, mathematics, science, and social studies, there are elements that cut across one or more disciplines. In fact, some skill areas span all four subject areas. It is important to identify the cross-cutting knowledge and skills that underlie and connect the four disciplinary areas. This important need has been addressed through the addition of a section of cross-disciplinary standards.

Think of cross-disciplinary standards as tools that college instructors in all areas use to challenge, engage, and evaluate students in each specific subject area. They include key cognitive skills such as reasoning and problem solving, as well as foundational skills such as reading, writing, data analysis, and conducting research.

Many of these skills are also taught within the context of a single subject area. Reading and writing are excellent examples. While the primary responsibility for developing reading and writing skills in secondary school resides within English/language arts courses, first-year college students are expected to employ a range of subject-specific reading and writing strategies and techniques in all of their courses. For example, they will write a lab report in a biology class or read primary source documents in a history class.

Academic and business leaders emphasize the importance of being able to apply these skills across a variety of contexts and subject matter. They describe 21st century learning and work environments in which the cross-disciplinary skills are prerequisites to solving many of the most important problems students will encounter in college and the workplace. These problems increasingly require applying knowledge across disciplines and subject areas and the mastery of a base set of communication and analysis skills that span subject areas. Students, then, not only need to possess content knowledge, but also need to be able to apply key cognitive skills to the academic tasks presented to them, most of which require much more than simple recall of factual knowledge. These cross-disciplinary standards enable students to engage in deeper levels of thinking across a wide range of subjects. They help high school students prepare for the transition from high school's primary focus on acquiring content knowledge to a postsecondary environment in which complex cognitive skills are necessary to achieve deeper understanding.

Understanding and Using The Cross-Disciplinary Standards

The cross-disciplinary standards are organized into two major areas: Key Cognitive Skills and Foundational Skills. The Key Cognitive Skills specify intellectual behaviors that are prevalent in entry-level college courses. The list includes intellectual curiosity, reasoning, problem solving, academic behaviors, work habits, and academic integrity. Foundational Skills consist of proficiencies students need to be able to transfer knowledge and apply it across the curriculum. These include reading, writing, conducting research, understanding and using data, and using technology.

The first three levels of the cross-disciplinary standards are written to apply across subject areas. The performance indicators found in the appendix illustrate how the cross-disciplinary standards are manifested within the subject areas. The Vertical Teams created an example in each subject area of at least one performance indicator that could be applied in that subject area. These indicators are meant to exemplify how the cross-disciplinary standards could be demonstrated in all subject areas.

I. Key Cognitive Skills

A. Intellectual curiosity

1. Engage in scholarly inquiry and dialogue.
2. Accept constructive criticism and revise personal views when valid evidence warrants.

B. Reasoning

1. Consider arguments and conclusions of self and others.
2. Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions.

3. Gather evidence to support arguments, findings, or lines of reasoning.
4. Support or modify claims based on the results of an inquiry.

C. Problem solving

1. Analyze a situation to identify a problem to be solved.
2. Develop and apply multiple strategies to solve a problem.
3. Collect evidence and data systematically and directly relate to solving a problem.

D. Academic behaviors

1. Self-monitor learning needs and seek assistance when needed.
2. Use study habits necessary to manage academic pursuits and requirements.
3. Strive for accuracy and precision.
4. Persevere to complete and master tasks.

E. Work habits

1. Work independently.
2. Work collaboratively.

F. Academic integrity

1. Attribute ideas and information to source materials and people.
2. Evaluate sources for quality of content, validity, credibility, and relevance.
3. Include the ideas of others and the complexities of the debate, issue, or problem.
4. Understand and adhere to ethical codes of conduct.

II. Foundational Skills

A. Reading across the curriculum

1. Use effective prereading strategies.
2. Use a variety of strategies to understand the meanings of new words.
3. Identify the intended purpose and audience of the text.
4. Identify the key information and supporting details.
5. Analyze textual information critically.
6. Annotate, summarize, paraphrase, and outline texts when appropriate.
7. Adapt reading strategies according to structure of texts.
8. Connect reading to historical and current events and personal interest.

B. Writing across the curriculum

1. Write clearly and coherently using standard writing conventions.
2. Write in a variety of forms for various audiences and purposes.
3. Compose and revise drafts.

C. Research across the curriculum

1. Understand which topics or questions are to be investigated.
2. Explore a research topic.
3. Refine research topic based on preliminary research and devise a timeline for completing work.
4. Evaluate the validity and reliability of sources.
5. Synthesize and organize information effectively.
6. Design and present an effective product.
7. Integrate source material.
8. Present final product.

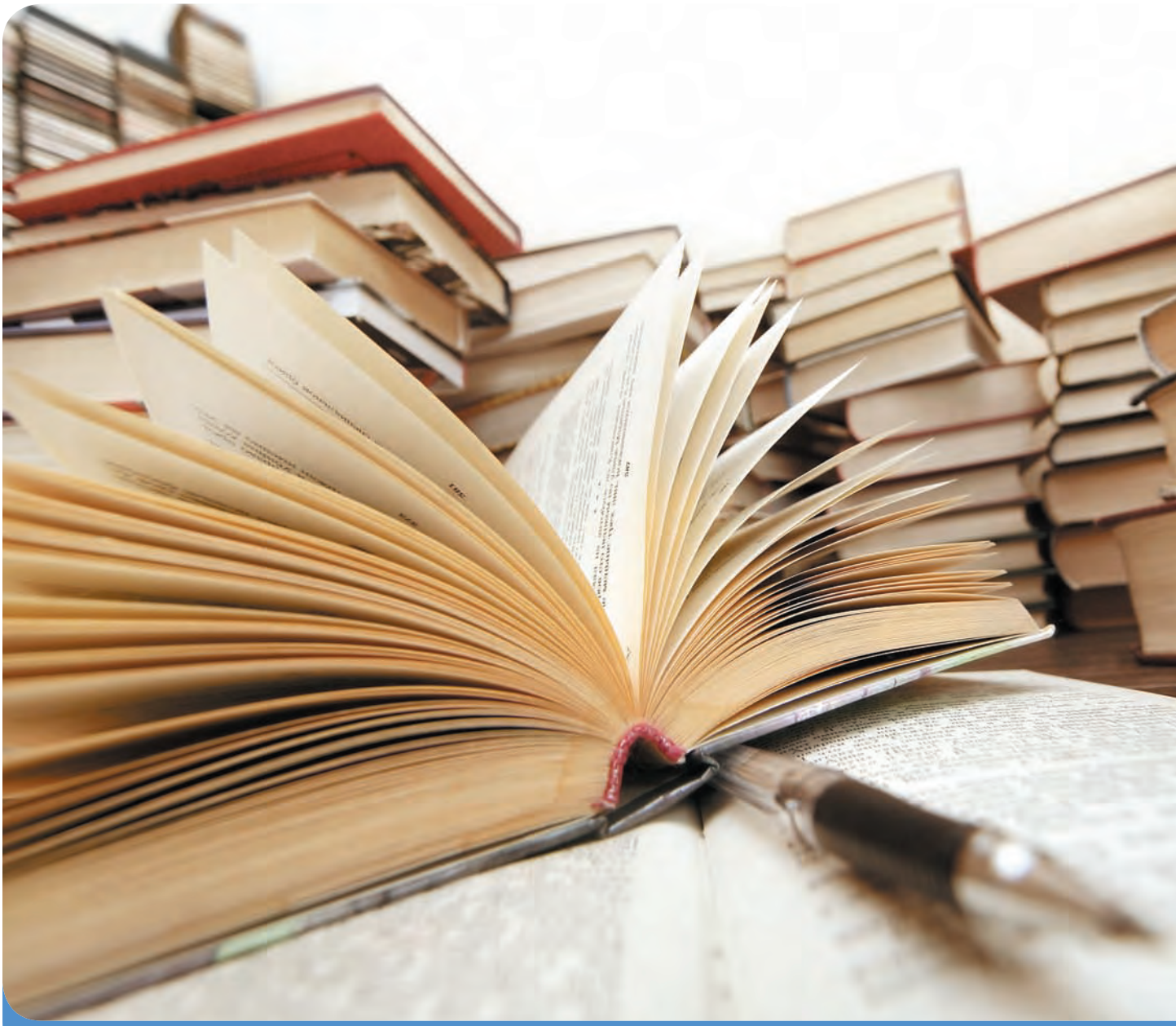
D. Use of data

1. Identify patterns or departures from patterns among data.
2. Use statistical and probabilistic skills necessary for planning an investigation and collecting, analyzing, and interpreting data.
3. Present analyzed data and communicate findings in a variety of formats.

E. Technology

1. Use technology to gather information.
2. Use technology to organize, manage, and analyze information.
3. Use technology to communicate and display findings in a clear and coherent manner.
4. Use technology appropriately.

Glossary of Terms



DOCUMENT GLOSSARY

Annotated list of sources
A bibliography that includes evaluation or comments on accuracy, completeness, usefulness, deficiencies, or other features of the sources.

Conjecture
A conclusion deduced by surmise or guesswork; a proposition (as in mathematics) before it has been proved or disproved.

Constant
Something invariable or unchanging, such as a number that has a fixed value in a given situation or universally.

Construction
The act or result of construing, interpreting, or explaining. Also involves creating a model that relates geometric principles.

Contrapositive
A proposition or theorem formed by negating both the hypothesis and conclusion of a given proposition or theorem and interchanging them (e.g., "if not-B then not-A" is the contrapositive of "if A then B").

Control
In experimental design, a sample or procedure that is virtually identical to the experimental sample except for the one variable (termed the independent variable) whose effect is being tested. If different results are obtained from the control and the experimental samples, this difference can be attributed to the effect of the independent variable.

Counterexample
An example that refutes or disproves a proposition or theory; the analysis of a set of facts in their relation to one another.

Culture
The integrated pattern of human knowledge, belief, and behavior that depends upon the capacity for learning and transmitting knowledge to succeeding generations; a society's way of life, including codes of manners, dress, language, religion, rituals, behavioral norms, and systems of belief.

Data
Factual information used as a basis for reasoning, discussion, or calculation. Reproducible observations that have been repeatedly confirmed are regarded as the highest quality data.

Deductive reasoning
The kind of reasoning in which the conclusion is necessitated by previously known premises. Usually understood as moving from a statement or description of a broad category to a description or conclusion regarding a specific instance or example within that category.

Diffusion
The geographic spread of phenomena such as culture, disease, or economic modes of production.

Dimensional analysis
A conceptual tool often applied in science and engineering to understand physical situations involving several different kinds of physical quantities. It is routinely used by scientists and engineers as a problem solving method to check the plausibility of derived equations and computations. It is also used to form reasonable hypotheses about complex physical situations that can be tested by experiment or by more developed theories of the phenomena. Calculations often require determining both the numerical value and the units of a variable in an equation. Dimensional analysis provides a useful method for determining the units of a variable in such cases.

Dissipative
A thermodynamically open system operating far from thermodynamic equilibrium in an environment with which it exchanges energy and matter. The term "dissipative system" is often used to describe one that releases heat. Simple examples include convection, cyclones, and hurricanes. More complex examples include lasers, Bénard cells, the Belousov-Zhabotinsky reaction, and at the most sophisticated level, life itself.

Diverse
Composed of distinct or unlike elements or qualities.

Domain
The set of elements to which a mathematical or logical variable is limited. Specifically, the set on which a function is defined.

Empirical
Originating in or based on observation or experience.

Ethnicity
A population of human beings whose members identify with each other, either on the basis of a presumed common genealogy or ancestry, recognition by others as a distinct group, or by common cultural, linguistic, religious, or physical traits.

DOCUMENT GLOSSARY

Function
In mathematics, a relation for which each element of the domain corresponds to exactly one element of the range.

Gender
The behavioral, cultural, or psychological traits typically associated with one sex.

Global community
The collective habitation of Earth by both humans and animals and the interconnection shared by means of inhabiting the same space.

Graphic organizers
Tools to visually categorize information such as calendars, outlines, or flow charts.

Human communities
Groups of people sharing an environment where intent, belief, resources, preferences, needs, risks, and a number of other conditions may be present and common, affecting the identity of the participants and their degree of cohesiveness.

Hypothesis
A tentative explanation or model to account for data, developed to draw out its logical or empirical consequences, and to guide the search for additional data.

Ideology
A systematic body of concepts, especially about human life or culture.

Inductive reasoning
The process of reasoning in which the premise of an argument is believed to support the conclusion but does not ensure it. Usually understood as moving from a statement or description of specific examples or instances to generalizable statements or descriptions of the entire class or category to which the examples belong.

Inquiry
A systematic investigation of facts or principles.

Key content
Overarching or keystone ideas of a discipline that reverberate as themes throughout the curriculum. The first and highest level in the organizing structure of the College and Career Readiness Standards (CCRS). Designated in this document by Roman numerals.

Law
In terms of science, a statement of order and relation in nature that has been found to be invariable under the same conditions.

Literary element
An individual aspect or characteristic of a whole work of literature.

Manipulatives
Objects (such as blocks) that a student is instructed to use in a way that teaches or reinforces a lesson.

Model
A system of postulates, data, and inferences presented as a mathematical description.

Multicultural
Of, relating to, reflecting, or adapted to a diverse range of cultures.

Natural phenomena
Facts or events observable in the natural world.

Organizing components
Knowledge and subject areas that organize a discipline around what students should retain, be able to transfer, and apply to new knowledge and skills. The second level in the organizing structure of the CCRS. Designated in this document by capital letters.

Performance expectations
Knowledge and skills that represent the important ideas of the current understanding of each organizing concept as well as the multiple contexts in which each organizing concept can be manifest. The third level in the organizing structure of the CCRS. Designated in this document by numbers.

Performance indicators
Examples of how to assess and measure performance expectations. The fourth level in the organizing structure of the CCRS. Designated in this document by lower-case letters.

Periodization
The organization of the past into units of inquiry, marked by key defining concepts.

Positive and negative controls
A controlled experiment generally compares the results obtained from an experimental sample against a control sample, which is practically identical to the experimental sample except for the one aspect whose effect is being tested. To be sure that the experimental procedures are working correctly, investigators

often include samples for which the expected result is already known. For example, in the widely-used Benedict's Test for glucose, the experimental set-up typically includes one sample in which sugar is known to be present (the positive control) and one sample in which sugar is known to be absent (the negative control). If the assay is working as expected, the positive control will yield the typical color change while the negative control will give no color change. If either of these samples produces results other than those expected, the investigator is alerted that something is interfering with the normal outcome of the assay, and all experimental results are unreliable.

Primary source
A document or other source of information that was created at or near the time being studied by an authoritative source, usually one with direct personal knowledge of the events being described.

Property
A quality or trait belonging to and especially peculiar to an individual or thing; an attribute common to all members of a class.

Qualitative
Description or distinction based on some quality rather than on some quantity.

Quantitative
A measurement based on a quantity or number rather than on a quality.

Quantitative inheritance
In genetics, traits that are determined by the combined influence of alleles at multiple loci. When studying such traits, geneticists often do not know the identities of the particular loci involved. Further, such traits do NOT show qualitatively discrete phenotypes, but rather these traits show continuous variation. Examples of human traits with continuous variation are height, athletic ability, and intelligence. Traits showing quantitative inheritance are determined by the combined influences of the genotype at many different loci, and the environmental setting in which the traits develop.

Race
A socially constructed segment of the human population defined by physical characteristics that are transmitted.

Recursive
In math, a procedure that can repeat itself indefinitely.

Region
A spatial area of the Earth's surface marked by specific criteria (e.g., multiple and overlapping political, cultural, and ecological regions existing in the present and the past).

Reliability
Ability of a system to perform and maintain its functions in routine circumstances, as well as in hostile or unexpected circumstances.

Rhetorical device
A technique that an author or speaker uses to evoke an emotional response in his audience (e.g., analogy, simile, metaphor).

Scientific ethics
Certain standards and guiding principles are universally accepted in scientific investigations, including the following:

- Data should never be falsified, either by reporting results that were not observed, or by failing to report completely all pertinent data. Neither should analyses be biased to favor one interpretation over other possible interpretations.
- Credit should be given to all individuals who made significant intellectual contributions to the investigation, and no credit should be claimed for someone else's work.
- Investigations should be carried out in ways that minimize danger to bystanders and participants should be informed in advance of any possible dangers. Part of an instructor's work is to train students to safely handle equipment, chemicals, and organisms in ways that minimize dangers to themselves and to others.
- If living organisms are used in investigations, they should be treated with respect and care. Efforts should be made to minimize or eliminate fear, pain, and suffering in those organisms, consistent with the nature of the investigation being done. Appropriate care guidelines as specified by institutional animal care policies should be rigorously followed.
- If humans are used as subjects in investigations, they must be fully apprised of any dangers or adverse effects that might result from the

investigation, and must voluntarily give informed consent to their participation, as specified by institutional review policies.

Secondary source
A work, such as a scholarly book or article, built from primary sources.

Social group
Grouping of people according to common characteristics (note: examples are given after this term is introduced in the standards).

Spatial
Relating to, occupying, or having the character of space.

Standard International Units
The modern form of the metric system of measurements. Units are defined for measurement of length, mass, time, electric current, thermodynamic temperature, amount of substance, and luminous intensity. Prefixes are added to units to produce a multiple (relative size) of the original unit (e.g., the factor 10 is named "deca" and symbolized by "da").

Strategy
A careful plan or method employed toward a goal.

System
A structured collection of parts or components that affect, influence, or interact with each other in defined, predictable ways; a form of social, economic, or political organization or practice; an organized set of doctrines, ideas, or principles usually intended to explain the arrangement or working of a systematic whole; an organized or established procedure; a manner of classifying, symbolizing, or schematizing.

Text
The main body of printed or written matter.

Theme
A unifying subject or idea.

Theory
A scientifically acceptable general principle, explanatory model, or body of principles offered to explain or account for observed phenomena. Usually understood to have been more extensively tested or supported by more data than a hypothesis.

Thesis
A position or proposition that a person advances and offers to maintain by argument; a proposition to be proved, or one advanced without proof.

Topic
A heading in an outlined argument or exposition; the subject of a discourse or of a section of a discourse.

Transactional
A communicative action or activity involving two parties or things that reciprocally affect or influence each other.

Validity
The quality of being well-grounded or justifiable; being at once relevant and meaningful.

Variable
Able or apt to vary; subject to variation or changes.

Vertical Team (VT)
For the purpose of this study, a panel of subject-specific secondary and postsecondary faculty established to develop CCRS that address what students must know and be able to do to succeed in entry-level courses offered at Texas institutions of higher education.

Vertical Team Members

The following faculty members served on the Vertical Teams that developed the draft version of the College and Career Readiness Standards contained in this document.

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Appendix

English/Language Arts Standards

with performance indicators

I. Writing

A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose.

1. **Determine effective approaches, forms, and rhetorical techniques that demonstrate understanding of the writer's purpose and audience.**

EXAMPLES

a. Prepare a topic proposal that specifies and justifies the topic, audience, and purpose.

b. Identify the types of writing (e.g., informational, analytical, polemical) and forms of writing (e.g., letter, editorial, essay) that are appropriate for the writer's particular purpose and audience.

c. Recognize rhetorical techniques appropriate to the purpose, audience, and form of a particular composition.

2. **Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.**

EXAMPLES

a. Utilize effective prewriting strategies: outline and prioritize ideas, anticipate questions that might be raised by readers, and identify appropriate primary and secondary source material.

b. Evaluate the reliability of possible sources and prepare an annotated bibliography.

3. **Evaluate relevance, quality, sufficiency, and depth of preliminary ideas and information, organize material generated, and formulate a thesis.**

EXAMPLES

a. Craft a thesis statement that articulates a position and logically organize relevant evidence and examples that support the thesis statement.

b. Become familiar with the various forms of plagiarism related to both textual and electronic sources and appropriately cite all borrowed material.

c. Demonstrate familiarity with different perspectives on a topic in addition to the writer's. Marshal evidence to accomplish the writer's purpose for the specified audience.

4. **Recognize the importance of revision as the key to effective writing. Each draft should refine key ideas and organize them more logically and fluidly, use language more precisely and effectively, and draw the reader to the author's purpose.**

EXAMPLES

a. Produce drafts that are logically organized in relation to the writer's purpose, audience, and chosen form.

b. Produce drafts that create tone and style appropriate to topic, audience, and task, including non-standard English when appropriate.

c. Produce drafts that use precise and engaging vocabulary appropriate to audience, purpose, and task, using sentences that are well-crafted and varied in structure.

d. Strengthen thesis statements, supported by relevant evidence and examples, cogent reasoning, anecdotes, and illustrations.

e. Revise drafts of functional texts (e.g., application, resume, operations manual) so that they demonstrate clear language and effective organization and formatting.

f. Produce texts that present technical information accurately in accessible language and utilize appropriate formatting structures (e.g., headings, graphics, white space).

g. Submit multiple drafts that reflect judicious use of self, peer, and instructor assessment.

5. **Edit writing for proper voice, tense, and syntax, assuring that it conforms to standard English, when appropriate.**

EXAMPLES

a. Edit for correct spelling, capitalization, and punctuation.

b. Edit for subject-verb agreement.

c. Edit for pronoun reference and agreement.

d. Improve coherence by increasing logical connections within and between sentences.

e. Edit for correct sentence structure (e.g., subordination, coordination).

f. Consult reference guides for citation conventions, grammar, mechanics, and punctuation.

g. Use a variety of proofreading techniques to compensate for the limitations of automated aids such as electronic spell and grammar checks.

II. Reading

A. Locate explicit textual information, draw complex inferences, and analyze and evaluate the information within and across texts of varying lengths.

1. **Use effective reading strategies to determine a written work's purpose and intended audience.**

EXAMPLES

a. Examine introductory material to understand the organization of a text.

b. Examine headline sections or other division markers, graphics, or sidebars to form an overview of a text.

c. Reread to deepen understanding of a text's literal and figurative meaning.

d. Compare and contrast texts that have similar subjects and themes.

e. When appropriate, make connections between a text and current and historical events.

2. **Use text features and graphics to form an overview of informational texts and to determine where to locate information.**

EXAMPLES

a. Evaluate data in tables, graphs, and charts.

b. Use tables of contents, headings, and subheadings to locate information for answering questions.

3. Identify explicit and implicit textual information including main ideas and author's purpose.

EXAMPLES

a. Analyze connections between main ideas and supporting details.

b. Identify author's purpose in a variety of texts, such as magazine articles.

4. Draw and support complex inferences from text to summarize, draw conclusions, and distinguish facts from simple assertions and opinions.

EXAMPLES

a. Analyze moral dilemmas in works of literature as revealed by the behaviors and underlying motivations of characters.

b. Summarize key points in important historical documents.

c. Distinguish inductive and deductive reasoning and evaluate the effectiveness of each in particular texts.

5. Analyze the presentation of information and the strength and quality of evidence used by the author, and judge the coherence and logic of the presentation and the credibility of an argument.

EXAMPLES

a. Evaluate the logical effectiveness of arguments.

b. Draw conclusions based on the sufficiency and strength of evidence used in research papers.

c. Identify shifts in argument or point of view and how they affect meaning.

6. Analyze imagery in literary texts.

EXAMPLE

a. Analyze how imagery reveals theme, sets tone, and creates meaning in literary texts.

7. Evaluate the use of both literal and figurative language to inform and shape the perceptions of readers.

EXAMPLES

a. Analyze a passage for word choice and voice.

b. Describe and compare how authors use style to evoke specific cultures, social classes, geographical locations, and time periods.

c. Explain how authors use dialect to convey character.

8. Compare and analyze how generic features are used across texts.

EXAMPLES

a. Explain how form or genre communicates meaning.

b. Analyze the use of persona in texts with diverse voices.

9. Identify and analyze the audience, purpose, and message of an informational or persuasive text.

EXAMPLES

a. Draw inferences about prevailing public opinions or concerns by reading primary sources from specific historical periods.

b. Explain how the author's use of rhetorical devices influences the reader, evokes emotions, and creates meaning.

c. Identify shifts in argument or point of view and how they affect meaning.

10. Identify and analyze how an author's use of language appeals to the senses, creates imagery, and suggests mood.

EXAMPLES

a. Identify words that convey mood and voice to inform readers of aspects of a setting or time period.

b. Explain how the author's use of literary elements creates meaning.

c. Analyze a text's ambiguities, subtleties, or contradictions.

11. Identify, analyze, and evaluate similarities and differences in how multiple texts present information, argue a position, or relate a theme.

EXAMPLES

a. Analyze similarities and differences in how authors develop similar themes across texts.

b. Read diaries written during a particular event or period and use evidence from the diaries to demonstrate similarities and differences in how each author feels about the event.

c. Analyze how authors present opposing viewpoints on the same issue.

B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.

EXAMPLES

a. Describe meanings of words read in texts based on context clues (e.g., definitions, examples, comparison, contrast, cause and effect, details provided in surrounding text).

b. Explain how connotation determines meaning.

2. Apply knowledge of roots and affixes to infer the meanings of new words.

EXAMPLE

a. Identify word meanings based on their Greek or Latin roots.

3. Use reference guides to confirm the meanings of new words or concepts.

EXAMPLE

a. Consult dictionaries, glossaries, thesauruses, or other guides to confirm word or phrase meanings.

C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods.

1. Read a wide variety of texts from American, European, and world literatures.

EXAMPLE

a. Know characteristic forms, subjects, and key authors of major periods.

2. Analyze themes, structures, and elements of myths, traditional narratives, and classical and contemporary literature.

EXAMPLES

a. Describe how contemporary authors adapt legends and myths to current settings and issues.

b. Analyze historical and social influences on literary works from various countries.

c. Use appropriate reading strategies to analyze a variety of literary and textual forms and genres.

d. Analyze universal or recurrent themes across a variety of works and genres.

3. Analyze works of literature for what they suggest about the historical period and cultural contexts in which they were written.

EXAMPLES

a. Analyze how significant historical events influence authors.

b. Describe how the social conditions of a particular geographic region or time influence authors.

4. Analyze and compare the use of language in literary works from a variety of world cultures.

EXAMPLES

a. Analyze works with similar themes to compare how the authors achieve their purpose.

b. Compare contemporary poems by writers from different nations and note similarities and differences in form, style, imagery, and theme.

D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances.

1. Describe insights gained about oneself, others, or the world from reading specific texts.

EXAMPLES

a. Compare a particular text to one's own life experiences and those of others.

b. Relate a text to current or historical events (e.g., compare current world events with those described in works from the early 20th Century).

2. Analyze the influence of myths, folktales, fables, and classical literature from a variety of world cultures on later literature and film.

EXAMPLE

a. Analyze how texts influence other texts, especially from another era, in terms of such elements as style, theme, and use of mythology.

III. Speaking

A. Understand the elements of communication both in informal group discussions and formal presentations (e.g., accuracy, relevance, rhetorical features, organization of information).

1. Understand how style and content of spoken language varies in different contexts and influences the listener's understanding.

EXAMPLES

a. Understand influences on language use (e.g., political beliefs, positions of social power, culture).

b. When speaking, observe audience reaction and adjust presentation (e.g., pace, tone, vocabulary, body language) to suit the audience.

2. Adjust presentation (delivery, vocabulary, length) to particular audiences and purposes.

EXAMPLE

a. Use effective verbal and non-verbal response strategies to adjust the message in response to audience's facial expressions and body language.

B. Develop effective speaking styles for both group and one-on-one situations.

1. Participate actively and effectively in one-on-one oral communication situations.

EXAMPLES

a. Communicate, in an appropriate format, information that was gathered by inquiry (e.g., research, interviews).

b. Communicate understanding of materials, concepts, and ideas (e.g., conference with instructor on a complex assignment).

2. Participate actively and effectively in group discussions.

EXAMPLES

a. Cooperate with peers to organize a group discussion: establish roles, responsibilities, ground rules; complete assignments; evaluate the work of the group based on agreed-upon criteria.

b. Use discussion techniques to arrive at a consensus or complete a task.

3. Plan and deliver focused and coherent presentations that convey clear and distinct perspectives and demonstrate solid reasoning.

EXAMPLES

a. Present research findings as appropriate in a variety of settings.

b. Use clear and concise language to explain complex concepts.

c. Practice speaking from notes as well as from a prepared speech.

d. Use appropriate media for public presentations.

IV. Listening

A. Apply listening skills as an individual and as a member of a group in a variety of settings (e.g., lectures, discussions, conversations, team projects, presentations, interviews).

1. Analyze and evaluate the effectiveness of a public presentation.

EXAMPLES

a. Critique the speaker's delivery skills (e.g., word choice, pitch, feelings, tone, voice).

b. Analyze, synthesize, and evaluate the effectiveness of a speaker's presentation.

c. Identify subtle uses of language.

2. Interpret a speaker's message; identify the position taken and the evidence in support of that position.

EXAMPLES

a. Evaluate the multiple levels of meaning and age, gender, social position, and cultural traditions of the speaker.

b. Analyze the effectiveness of a speaker's nonverbal messages (e.g., eye contact, gestures, facial expressions, posture, spatial proximity).

3. Use a variety of strategies to enhance listening comprehension (e.g., focus attention on message, monitor message for clarity and understanding, provide verbal and nonverbal feedback, note cues such as change of pace or particular words that indicate a new point is about to be made, select and organize key information).

EXAMPLES

a. Develop and ask questions related to the content for clarification and elaboration.

b. Follow complex verbal instructions that include technical vocabulary and processes.

c. Paraphrase or summarize information.

d. Take concise notes that accurately reflect the presentation or discussion.

B. Listen effectively in informal and formal situations.

1. Listen critically and respond appropriately to presentations.

EXAMPLES

a. Define new words and concepts, and note questions raised by the presentation to interpret the speaker's content and attitude toward the subject.

b. Take notes that synthesize or highlight ideas for critical reflection.

c. Use critical listening responses, such as refutation and commentary, to analyze, synthesize, and evaluate the accuracy and effectiveness of the presentation.

2. Listen actively and effectively in one-on-one communication situations.

EXAMPLES

a. Accurately paraphrase what has been heard.

b. Revise a draft based on oral peer critique.

3. Listen actively and effectively in group discussions.

EXAMPLES

a. Take effective notes during group discussion.

b. Participate in a productive deliberation.

c. Use effective listening techniques to complete a group task.

V. Research

A. Formulate topic and questions.

1. Formulate research questions.

EXAMPLES

a. Inventory one's knowledge of, attitude toward, and interest in the topic.

b. Use strategies like those in the writing process to generate questions and areas to pursue.

c. Conduct interviews with experts to identify questions central to a research topic.

d. List the fundamental questions that specialists and/or non-specialists raise about a research topic.

2. Explore a research topic.

EXAMPLES

a. Produce an annotated list of sources consulted, differentiating among primary, secondary, and other sources.

b. Outline the most significant controversies or questions on a research topic.

c. Write an account of the status of the subject in the research community, including what is known or surmised about the subject and what controversies or questions persist.

3. Refine research topic and devise a timeline for completing work.

EXAMPLES

a. Adjust topic based on preliminary research.

b. Develop a detailed and realistic schedule for researching and completing a project.

B. Select information from a variety of sources.

1. Gather relevant sources.

EXAMPLES

a. Use general and specialized reference works and databases to locate sources.

b. Locate electronic sources using advanced search strategies.

c. Select an appropriate range of source materials.

2. Evaluate the validity and reliability of sources.

EXAMPLES

a. Follow a set of criteria to determine the validity and reliability of sources.

b. Identify claims found in one or more of the sources that require support or verification and evaluate the validity of the information.

c. Evaluate data presented in graphics, tables, and charts.

3. Synthesize and organize information effectively.

EXAMPLES

a. Manage sources appropriately.

b. Explain how source materials on the same subject represent more than two points of view.

c. Select quotations that support the thesis.

d. Determine what evidence best supports the major points.

e. Determine the best order for presenting major and minor points.

C. Produce and design a document.

1. Design and present an effective product.

EXAMPLES

a. Use the composing process to develop a research product.

b. Integrate source material into text by a combination of summarizing, paraphrasing, and quoting.

c. Use citation system specified by or appropriate to the assignment.

d. Design a report using features such as headings and graphics appropriate to the writing task.

2. Use source material ethically.

EXAMPLES

a. Paraphrase accurately.

b. Use appropriate media for public presentation of research results.

c. Cite sources appropriately.

d. Document sources using a standard format appropriate to the assignment.

Mathematics Standards

with performance indicators

I. Numeric Reasoning

A. Number representation

1. Compare real numbers.

EXAMPLES

a. Classify numbers as natural, whole, integers, rational, irrational, real, imaginary, and/or complex.

b. Use and apply the relative magnitude of real numbers by using inequality symbols to compare them and locate them on a number line.

c. Order real numbers with and without a calculator using relationships involving decimals, rationals, exponents, and radicals.

d. Represent any rational number in scientific notation.

2. Define and give examples of complex numbers.

EXAMPLES

a. State the standard form used to represent complex numbers and describe their real and imaginary parts.

b. Represent i^n and square roots of negative numbers as complex numbers.

c. Understand that to solve certain problems and equations, number systems need to be extended from whole numbers to the set of all integers (positive, negative, zero), from integers to rational numbers, from rational numbers to real numbers (rational and irrational numbers), and from real numbers to complex numbers; define and give examples of each of these types of numbers.

B. Number operations

1. Perform computations with real and complex numbers.

EXAMPLES

a. Add, subtract, multiply, and divide real numbers accurately, including irrational numbers, numbers with exponents, and absolute value.

b. Transform numerical expressions using field properties (especially the distributive property), order of operations, and properties of exponents.

c. Solve problems involving rational numbers, ratios, percents, and proportions in context of the situation.

d. Calculate the sum, difference, product, and quotient of two complex numbers and express the result in standard form.

C. Number sense and number concepts

1. Use estimation to check for errors and reasonableness of solutions.

EXAMPLES

a. Identify the most reasonable solution for a given problem from a list of possible solutions; justify the choice.

b. Use mental estimates to detect potential errors when using a calculator.

c. Justify the need for an exact answer or an estimate in a given problem (e.g., doing taxes vs. determining amount of paint needed for a room).

II. Algebraic Reasoning

A. Expressions and equations

1. Explain and differentiate between expressions and equations using words such as "solve," "evaluate," and "simplify."

EXAMPLES

a. Define what an expression or equation represents.

b. Distinguish among and apply different uses of equations to: state a definition, represent a conditional statement, and represent an identity.

B. Manipulating expressions

1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions).

EXAMPLES

a. Use the algebraic (field) properties (e.g., commutative, associative, distributive) and order of operations to transform expressions to equivalent expressions.

b. Use the algebraic (field) properties and order of operations to evaluate variable expressions when given the value of the variables.

c. Explain why the algorithms and procedures used to transform algebraic expressions are valid.

C. Solving equations, inequalities, and systems of equations

1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.

EXAMPLES

a. Solve equations and inequalities in one variable (e.g., numerical solutions, including those involving absolute value, radical, rational, exponential, and logarithmic).

b. Solve for any variable in an equation or inequality that has two or more variables (e.g., literal equations).

c. Use equality and algebraic (field) properties to solve an equation by constructing a sequence of equivalent equations.

d. Use the elimination, substitution, and/or graphing method to solve a linear system of equations with two variables.

e. Use technology when using matrices to solve linear systems with two or three variables.

2. Explain the difference between the solution set of an equation and the solution set of an inequality.

EXAMPLES

a. Represent the solution set of an equation or inequality in various ways (e.g. set notation, interval notation, graphical representation, including shading).

b. Understand that the real solution to an equation can be represented as the x-coordinate of the point of intersection of two graphs.

c. Understand the relationship between a solution of a system of two linear equations with two variables and the graphs of the corresponding lines.

d. Graph a function and understand the relationship between its real zeros, roots, and the x-intercepts of its graph.

D. Representations

1. Interpret multiple representations of equations and relationships.

EXAMPLES

a. Interpret graphical representations of equations.
b. Understand how variables can be used to express generalizations and represent situations.
c. Recognize the solution(s) to an equation from a table of values.
d. Describe numerical patterns using algebraic expressions and equations in closed or recursive forms, such as arithmetic sequences.

2. Translate among multiple representations of equations and relationships.

EXAMPLES

a. Explain the common information presented in multiple representations of a relationship.
b. Translate one given representation to another representation (e.g., tabular to graphic, graphic to symbolic).
c. Use multiple representations to determine rate of change.
d. Determine if a relationship given in graphical, tabular, or symbolic form is linear or nonlinear.

III. Geometric Reasoning

A. Figures and their properties

1. Identify and represent the features of plane and space figures.

EXAMPLES

a. Construct and use drawings, models, and coordinate representations of plane and space figures in order to solve problems by hand and using technology.
b. Recognize and describe the plane-figure components of three-dimensional figures, such as prisms, pyramids, cylinders, and cones.
c. Describe and use cross-sections and nets of three-dimensional figures to relate them to plane figures.
d. Describe the conic sections as intersections of a plane with a cone.
e. Recognize and describe orthographic (top, front, side) and isometric views of three-dimensional geometric figures.

2. Make, test, and use conjectures about one-, two-, and three-dimensional figures and their properties.

EXAMPLES

a. Develop and verify attributes of lines and parts of lines in a plane and in space: parallel, intersecting, perpendicular, and skew lines; and angle relationships associated with transversals on parallel lines.
b. Develop and verify angle relationships: vertical, complementary, supplementary, angles on parallel lines, angle-side relations in a triangle, interior/exterior angles on polygons, and angles on circles.
c. Develop, verify, and extend properties of circles, including properties of angles, arcs, chords, tangents, secants, and spheres.
d. Develop and verify properties of triangles and quadrilaterals (e.g., triangle congruence conditions, properties of a parallelogram).
e. Develop and verify properties of parts of prisms, cylinders, pyramids, and cones.
f. Apply properties of geometric figures to solve problems.

3. Recognize and apply right triangle relationships including basic trigonometry.

EXAMPLES

a. Apply the Pythagorean Theorem and its converse to solve real-life situations in two and three dimensions.
b. Apply Pythagorean triples and special right triangle relationships to solve problems.
c. Solve right triangle situations using sine, cosine, and tangent.

B. Transformations and symmetry

1. Identify and apply transformations to figures.

EXAMPLES

a. Identify whether a transformation is a reflection, rotation, translation, or dilation.

b. Find the image or pre-image of a given plane figure under a congruence transformation (e.g., translation, reflection, rotation) or composition of these transformations in coordinate and non-coordinate plane settings.

c. Find the image or pre-image of a given plane figure under a dilation or composition of dilations in coordinate and non-coordinate plane settings.

d. Use transformations and compositions of transformations to investigate and justify geometric properties of a figure (e.g., the sum of the three angles inside any triangle is 180 degrees).

2. Identify the symmetries of a plane figure.

EXAMPLES

a. Identify and distinguish between reflectional and rotational symmetry in an object.

b. Identify congruent corresponding parts in a figure with reflectional or rotational symmetry.

c. Identify lines of symmetry in plane figures to show reflection.

3. Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures.

EXAMPLES

a. Use congruence transformations to justify congruence among triangles and to identify congruent corresponding parts.

b. Use dilations and scale factors to investigate similar figures and determine missing image or pre-image dimensions.

c. Identify symmetries in design situations and describe transformations used to create the symmetry and design (e.g., tiling problems).

C. Connections between geometry and other mathematical content strands

1. Make connections between geometry and algebra.

EXAMPLES

a. Describe lines in the coordinate plane using slope-intercept and point-slope form.

b. Use slopes to describe the steepness and direction of lines in the coordinate plane and to determine if lines are parallel, perpendicular, or neither.

c. Relate geometric and algebraic representations of lines, segments, simple curves, and conic sections [e.g., describe algebraically a circle centered at (h, k) with radius (r)].

d. Investigate and justify properties of triangles and quadrilaterals using coordinate geometry.

e. Relate the number of solutions to a system of equations of lines to the number of intersections of two or more graphs.

2. Make connections between geometry, statistics, and probability.

EXAMPLES

a. Compute probabilities using lengths of segments or areas of regions representing desired outcomes.

b. Construct a trend line or a regression line for a scatter plot and use it to make predictions.

3. Make connections between geometry and measurement.

EXAMPLES

a. Determine perimeter and area of two-dimensional figures and surface area and volume of three-dimensional figures using measurements and derived formulas.

b. Find the measures of the lengths and areas of similar figures and of the lengths, surface areas, and volumes of similar solids.

c. Find arc length and sector area for a given central angle on a circle.

D. Logic and reasoning in geometry

1. Make and validate geometric conjectures.

EXAMPLES

a. Use drawings, manipulatives (e.g., paper folding, transformations) and constructions (e.g., compass/straight-edge, computer graphing utility) to investigate patterns and make conjectures about geometric properties of figures.

b. Use counterexamples to verify that a geometric conjecture is false.

c. Give a logical argument in a variety of formats to verify that a geometric conjecture is true.

d. Use a conditional statement to describe a property of a geometric figure. State and investigate the validity of the statement's converse, inverse, and contrapositive.

e. Make the connection between a biconditional statement and a true conditional statement with a true converse.

2. Understand that Euclidean geometry is an axiomatic system.

EXAMPLES

a. Distinguish among theorems, properties, definitions, and postulates and use them to verify conjectures in Euclidean geometry.

b. Understand that non-Euclidean geometries exist.

IV. Measurement Reasoning

A. Measurement involving physical and natural attributes

1. Select or use the appropriate type of unit for the attribute being measured.

EXAMPLES

a. Determine appropriate units of measurement needed for the object being measured in a given situation (e.g., unit analysis, degree, or radian measure of an angle.)

b. Select and accurately use an appropriate tool to make measurements.

c. Recognize and use significant digits to determine the accuracy of a measurement in problem situations.

d. Use the appropriate level of precision when providing solutions to measurement problems.

e. Know when to estimate and approximate measurements for given problem situations.

B. Systems of measurement

1. Convert from one measurement system to another.

EXAMPLE

a. Convert between basic units of measurement from one system to another system (e.g., inches to centimeters, kilometers to miles, pounds to kilograms).

2. Convert within a single measurement system.

EXAMPLE

a. Convert between basic units of measurement within a system (e.g., inches to feet, square inches to square feet, grams to milligrams).

C. Measurement involving geometry and algebra

1. Find the perimeter and area of two-dimensional figures.

EXAMPLES

a. Describe the difference between perimeter and area of two-dimensional figures and the units of measurement used in their calculation.

b. Solve problems involving perimeter and area of two-dimensional simple and composite figures with some unknown dimensions (e.g., triangles, quadrilaterals, circles).

c. Solve problems involving the distance between two points in the coordinate plane and make algebraic and geometric connections.

2. Determine the surface area and volume of three-dimensional figures.

EXAMPLES

a. Describe the difference between surface area and volume of three-dimensional figures and the relationship in the units of measurement used in their calculation.

b. Solve problems involving surface area and volume of three-dimensional simple and composite figures with some unknown dimensions, including prisms, pyramids, cylinders, cones, and spheres.

3. Determine indirect measurements of figures using scale drawings, similar figures, the Pythagorean Theorem, and basic trigonometry.

EXAMPLES

a. Determine how changes in dimension affect the perimeter, area, and volume of common geometric figures and solids.

b. Solve problems using proportional relationships in similar two-dimensional and three-dimensional figures to determine unknown measurements.

c. Determine unknown sides and angles in a right triangle using the Pythagorean Theorem and basic trigonometry.

D. Measurement involving statistics and probability

1. Compute and use measures of center and spread to describe data.

EXAMPLES

a. Select, compute, and justify measurements of center (e.g., mean, median, mode) based on the data set and other influential information.

b. Select, compute, and justify measurements of variation (e.g., range, IQR, percentiles, variance, standard deviation) based on the data set and other influential information.

c. Calculate weighted averages, indices, and ratings.

2. Apply probabilistic measures to practical situations to make an informed decision.

EXAMPLES

a. Justify decisions made from probability measures from a set of data.

b. Interpret given probability measures in a problem.

c. Use and interpret a normal distribution as a mathematical model of measurement for summarizing some sets of data.

V. Probabilistic Reasoning

A. Counting principles

1. Determine the nature and the number of elements in a finite sample space.

EXAMPLES

a. Make lists, tables, and tree diagrams to represent all possible outcomes in determining specifics of the sample space.

b. Determine the number of ways an event may occur using combination and permutation formulas and the Fundamental Counting Principle.

B. Computation and interpretation of probabilities

1. Compute and interpret the probability of an event and its complement.

EXAMPLES

a. Conduct an experiment or simulation to compute the empirical probability of an event and its complement.

b. Compute and interpret the theoretical probability of a simple event and its complement.

c. Compare the empirical and theoretical probabilities of an event (e.g., experimental probabilities converge to theoretical probability as the number of trials increases).

2. Compute and interpret the probability of conditional and compound events.

EXAMPLES

a. Distinguish between independent and dependent events.

b. Explain the meaning of conditional probability and know when to use it.

c. Compute conditional probability.

d. Compute the probability of compound events using tree diagrams, tables, and other methods.

e. Compute the probability for dependent or independent compound events.

VI. Statistical Reasoning

A. Data collection

1. Plan a study.

EXAMPLES

a. Determine question(s) that can be answered with data.

b. Explain the difference between observational and experimental studies.

c. Design and employ a plan of study to collect appropriate data.

d. Use a variety of sampling methods (e.g., census, systematic sampling, random vs. non-random sampling).

e. Identify sampling techniques used in our world (e.g., political polls, medical studies) and determine possible sources of bias.

f. Compare and contrast data variability using different sampling methods.

B. Describe data

1. Determine types of data.

EXAMPLES

a. Recognize and describe the differences between quantitative and qualitative data.

b. Recognize and describe univariate and bivariate data.

2. Select and apply appropriate visual representations of data.

EXAMPLES

a. Organize and construct graphical displays of data (e.g., line plots, bar graphs, histograms, box plots, scatter plots) to describe the distribution of data.

b. Read and interpret graphical displays of data.

3. Compute and describe summary statistics of data.

EXAMPLES

a. Calculate, describe, and use the appropriate measure of center (e.g., mean, median, mode) and spread (e.g., range, IQR, percentiles, variance, standard deviation).

b. Describe the effect of outliers on summary statistics.

4. Describe patterns and departure from patterns in a set of data.

EXAMPLES

a. Describe any natural variability evident in the results within the context of the situation.

b. Describe any influences that may have induced variability within the context of the situation.

C. Read, analyze, interpret, and draw conclusions from data

1. Make predictions and draw inferences using summary statistics.

EXAMPLES

a. Make a prediction about long-run behavior (e.g., coin toss).

b. Draw conclusions from analyzing a set of data.

2. Analyze data sets using graphs and summary statistics.

EXAMPLES

a. Analyze and compare distributions by describing similarities and differences of centers and spreads within and between data sets.

b. Analyze and describe similarities and differences by comparing graphical distributions (e.g., parallel box plots, back-to-back stem-leaf plots) within and between data sets.

3. Analyze relationships between paired data using spreadsheets, graphing calculators, or statistical software.

EXAMPLES

a. Describe relationship and trend of paired data observed from scatter plots in the context of the situation.

b. Choose an appropriate linear or non-linear regression model to fit paired data based on graphical analysis.

c. Make a prediction using the appropriate regression model and describe any limitations to the calculated prediction.

4. Recognize reliability of statistical results.

EXAMPLES

a. Evaluate media reports by analyzing the study design, data source, graphical representation of data, and analyzed data results reported (or not reported).

b. Describe generalizations and limitations of results from observational studies, experiments, and surveys.

c. Identify and explain misleading uses of data.

d. Describe the reliability of statistical results from a set of data.

VII. Functions

A. Recognition and representation of functions

1. Recognize whether a relation is a function.

EXAMPLE

a. Determine if a relationship given in tabular, graphic, symbolic, or verbal form defines a function.

2. Recognize and distinguish between different types of functions.

EXAMPLES

a. Recognize general forms of linear, quadratic, rational, absolute value, square root, exponential, and logarithmic functions, and other advanced forms such as trigonometric or power functions.

b. Recognize the distinction between a discrete and a continuous function.

c. Recognize a sequence as a function whose domain is a set of whole numbers.

d. Recognize computations (e.g., sums, products, GCF, LCM, mean, surface area) as evaluating a function with two or more inputs and one output.

e. Recognize a plane geometric transformation as evaluating a function with two inputs and two outputs.

B. Analysis of functions

1. Understand and analyze features of a function.

EXAMPLES

a. Understand functional notation and evaluate a function at a specified point in its domain.

b. Determine the domain and range of a function defined by a table of values, graph, symbols, or verbal description.

c. Approximate or determine the x- and y-values of a function given in tabular, graphical, symbolic, or verbal form.

d. Determine and explain if a function, defined verbally or given in tabular, graphical, or symbolic form, is one-to-one.

2. Algebraically construct and analyze new functions.

EXAMPLES

a. Determine the domain and range of a combination or composition of two functions.

b. Formulate the composition of two functions.

c. Apply basic transformations to parent functions [e.g., af(x), f(x)+b, f(x+c)] and interpret the results verbally and graphically.

d. Analyze the effects of parameter changes of basic functions, [e.g., f(x)=mx+b, where m and/or b changes].

e. Analyze and apply piece-wise defined functions (e.g., step functions).

f. Determine the inverse function of a given function in tabular, symbolic, or graphical form, if it exists (e.g., the inverse of an exponential function is a logarithmic function).

g. Use properties of inverse functions to solve problems (e.g., inverse trigonometric functions to find angles in a right triangle).

C. Model real world situations with functions

1. Apply known function models.

EXAMPLES

a. Apply a linear model for a situation represented by a constant rate of change.

b. Apply given quadratic models to solve problems (e.g., area, velocity, projectile motion).

c. Apply exponential models (e.g., compound interest, growth and decay models) to solve problems.

d. Apply proportional or inverse variation models to solve problems.

e. Recognize and solve problems that can be modeled using a system of two equations in two variables, such as mixture problems.

2. Develop a function to model a situation.

EXAMPLES

a. Analyze a situation algebraically or graphically and determine if the relationship suggests a linear trend.

b. Use technology to determine a linear regression model for a given situation.

c. Identify real world situations that can be modeled by functions (e.g., situations in science, business, economics).

VIII. Problem Solving and Reasoning

A. Mathematical problem solving

1. Analyze given information.

EXAMPLES

a. Extract needed facts and relationships from given information.

b. Identify what is known, not known, and what one wants to know in a problem.

c. Distinguish relevant from irrelevant information in a given situation.

d. Determine the problem(s) to be solved.

e. Identify additional information needed to reach a solution.

f. Test ideas with specific cases.

2. Formulate a plan or strategy.

EXAMPLES

a. Select or develop an appropriate problem-solving strategy (e.g., drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, working backwards).

b. Identify needed algorithms or formulas.

c. Determine the nature of a possible solution and the degree of precision required.

3. Determine a solution.

EXAMPLES

a. Make and test conjectures.

b. Find an approximate solution with or without technology.

c. Identify and solve sub-problems.

d. Use multiple representations (e.g., analytic, numerical, verbal, and graphical) to support a solution.

4. Justify the solution.

EXAMPLES

a. Provide a clear explanation of the reasoning used to determine a solution.

b. Evaluate the reasonableness of the solution in the context of the original problem.

c. Verify a general solution in special cases.

d. Review and check strategies and calculations, using an alternative approach when possible.

e. Demonstrate an understanding of the mathematical ideas behind the steps of a solution, not just the solution.

5. Evaluate the problem-solving process.

EXAMPLES

a. Reflect on the problem-solving process and use mathematical knowledge to evaluate its effectiveness.

b. Recognize that a mathematical problem can be solved in a variety of ways.

c. Consider extensions and generalizations of the problem, process, or solution.

B. Logical reasoning

1. Develop and evaluate convincing arguments.

EXAMPLES

a. Use examples to formulate conjectures.

b. Use counterexamples to refute conjectures.

c. Determine the validity of a conditional statement, its converse, its inverse, and its contrapositive.

2. Use various types of reasoning.

EXAMPLES

a. Use inductive reasoning to formulate a conjecture.

b. Use deductive reasoning to prove a statement or validate a conjecture.

c. Use geometric and visual reasoning.

d. Use multiple representations (e.g., analytic, numerical, verbal, graphical) to support an argument.

C. Real world problem solving

1. Formulate a solution to a real world situation based on the solution to a mathematical problem.

EXAMPLES

a. Make simplifying assumptions about a real world situation to formulate and solve an idealized mathematical problem.

b. Convert given information into an appropriate mathematical model.

c. Interpret results of the mathematical problem in terms of the original real world situation.

2. Use a function to model a real world situation.

EXAMPLES

a. Choose a function suitable for modeling a real world situation presented using words or data.

b. Determine and interpret the meaning of rates of change, intercepts, zeros, extrema, and trends.

c. Use an appropriate linear or non-linear function (e.g., quadratic, exponential).

d. Use a sequence expressed in recursive or closed form.

3. Evaluate the problem-solving process.

EXAMPLES

a. Evaluate a real world solution for accuracy and effectiveness.

b. Compare and analyze various methods for solving a real world problem.

IX. Communication and Representation

A. Language, terms, and symbols of mathematics

1. Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem.

EXAMPLES

a. Use variables to represent quantities in contextual situations.

b. Analyze problem situations and represent them using algebraic expressions and equations.

c. Use and understand the many ways an "=" sign is used (e.g., to state a definition or formula; to represent an identity; to express a conditional equation; to identify constant and variable terms in expressions, equations, and inequalities).

d. Understand and use interval, set, and function notation.

e. Understand that certain symbols and words can have multiple meanings [e.g., (1, 2) can represent a point or an interval].

2. Use mathematical language to represent and communicate the mathematical concepts in a problem.

EXAMPLES

a. Represent information in a problem using algebraic expressions, equations, and inequalities.

b. Recognize contextual problems represented by linear and non-linear models.

3. Use mathematics as a language for reasoning, problem solving, making connections, and generalizing.

EXAMPLES

a. Use inductive and deductive reasoning to reach valid conclusions.

b. Write the converse, inverse, and contra-positive of any given conditional statement.

B. Interpretation of mathematical work

1. Model and interpret mathematical ideas and concepts using multiple representations.

EXAMPLES

a. Make tables of inputs and outputs for mathematical relations/functions.

b. Write symbolic representations for a verbal description of a relationship.

c. Construct visual representations (e.g., a graph) of relationships.

d. Describe orally or in written format the behavior of a mathematical idea using graphs, diagrams, tables, and algebraic representations.

e. Represent inequalities using graphs, interval notation, and set notation.

f. Use multiple representations of rate of change.

2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context.

EXAMPLES

a. Interpret mathematical information in an article from a media source.

b. Summarize mathematical information given orally and visually in a media report.

C. Presentation and representation of mathematical work

1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words.

EXAMPLES

a. Communicate ideas mathematically using symbols (e.g., equal signs, parentheses, subscripts, superscripts, order relations, set notation).

b. Develop geometric models to represent concepts and relationships (e.g., scatter plots).

c. Recognize and explain the meaning of information presented using mathematical notation.

2. Create and use representations to organize, record, and communicate mathematical ideas.

EXAMPLES

a. Use Venn diagrams to represent sets of real numbers, surveys, and other set relationships.

b. Show solutions of equations and inequalities, and solutions of systems of equations and inequalities, using the real number line and rectangular coordinate system.

c. Construct and use graphic organizers (e.g., tables, bubble maps, Venn diagrams, tree diagrams).

3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.

EXAMPLES

a. Explain reasoning in both oral and written forms using notation, terminology, and logic.

b. Communicate reasons associated with performing steps in algebraic methods (e.g., explaining why a quadratic equation must be written in standard form first when solving by factoring).

c. Identify units associated with any variables and constants used in a problem solution.

X. Connections

A. Connections among the strands of mathematics

1. Connect and use multiple strands of mathematics in situations and problems.

EXAMPLES

a. Represent a geometric two-dimensional figure on the rectangular coordinate plane using a set of equations or inequalities.

b. Connect the concepts of ratios, rates, proportions, and percents (e.g., show slope as constant rate of change using similar triangles).

c. Compare and contrast different mathematical concepts and procedures that could be used to complete a particular task.

d. Combine appropriate numeric, algebraic, geometric, and statistical/probabilistic methods to solve a given problem.

2. Connect mathematics to the study of other disciplines.

EXAMPLES

a. Use mathematical models to solve problems in areas such as science, business, and economics.

b. Use applications of mathematics (e.g., carbon dating, exponential population growth, amortization tables).

c. Use geometric concepts and properties to solve problems in fields such as art and architecture.

B. Connections of mathematics to nature, real world situations, and everyday life

1. Use multiple representations to demonstrate links between mathematical and real world situations.

EXAMPLES

a. Model a given real world situation using an appropriate combination of sketches, graphs, and algebraic expressions.

b. Describe a given real world situation in algebraic terms, use that description to produce a geometric description, and vice-versa.

c. Connect mathematically created tables, graphs, and functions to fit real life situations (e.g., download data from the Internet).

2. Understand and use appropriate mathematical models in the natural, physical, and social sciences.

EXAMPLES

a. Identify mathematical sequences, ratios, and patterns in nature (e.g., Fibonacci sequence, golden ratio).

b. Explain the importance of margin of error in results of surveys.

c. Apply known mathematical relations (e.g., Ohm's Law, Hardy-Weinberg Law, rule for continuously compounded interest) to solve real world problems.

3. Know and understand the use of mathematics in a variety of careers and professions.

EXAMPLES

a. Identify mathematics used in several careers and professions.

b. Identify several careers or professions that are mathematically intensive fields.

Science Standards

with performance indicators

I. Nature of Science: Scientific Ways of Learning and Thinking

A. Cognitive skills in science

1. Utilize skepticism, logic, and professional ethics in science.

EXAMPLES

a. Read or listen to statements of arguments carefully and critically, evaluate what evidence deserves attention and what should be dismissed, and distinguish careful arguments from questionable ones.

b. Recognize indicators and symptoms of faulty or unreliable statements or arguments. These indicators include the following:

- Premises of the argument are not made explicit.
- Conclusions do not follow logically from the evidence.
- Argument is based on analogy but the comparison is faulty.
- Fact and opinion intermingle, opinions are presented as fact, or it is not clear which is which.
- Celebrity is used as authority.
- Vague attributions are used in place of specific references or citations.
- Reports of experimental results fail to describe appropriate controls.
- Faulty graphs distort appearance of results by omitting data, omitting part of the scale, using no scale at all, etc.

- Average (mean) results are reported, but not the amount of variation around the mean.
- Absolute and proportional quantities or percentages are mixed together without clarification.
- Other incorrect, misleading, or shoddy practices are used, as described in more detail in Science for All Americans, a report from Project 2061, AAAS, 1990.

c. Base alternate explanations on data and follow accepted, logical rules.

d. Demonstrate ability to review and evaluate articles from a variety of sources, including scientific journals, websites, and

popular publications to identify examples of proper statements and arguments, as well as examples where good practices were not exhibited.

2. Use creativity and insight to recognize and describe patterns in natural phenomena.

EXAMPLES

a. Categorize a given collection of objects and describe the criteria for categorization (e.g., by constructing a dichotomous key).

b. Determine a line of best fit for a given set of graphical data and predict by interpolation or extrapolation where additional data points are likely to occur.

c. Formulate explanatory models, mechanisms, or narratives that relate observed features to each other and that describe cause-effect or other relationships among natural phenomena.

d. Examine and analyze new situations or problems in light of previously understood principles.

3. Formulate appropriate questions to test understanding of natural phenomena.

EXAMPLES

a. Determine what additional data needs to be collected to draw conclusions from a given series of observations.

b. Make recommendations at the conclusion of an experiment to extend, adjust, or apply the research conducted.

4. Rely on reproducible observations of empirical evidence when constructing, analyzing, and evaluating explanations of natural events and processes.

EXAMPLES

a. Know how to keep and have experience in keeping a journal or other record that accurately describes observations; that distinguishes actual observations from ideas, speculations, and opinions about what was observed; and that is understandable weeks or months later.

b. Review and evaluate articles from a variety of scientific journals and pseudo-scientific/non-scientific publications and determine if the information is based on empirical evidence.

c. Distinguish between personal opinion and evidence gathered by observation and analysis.

B. Scientific inquiry

1. Design and conduct scientific investigations in which hypotheses are formulated and tested.

EXAMPLES

a. Develop hypotheses that lead to if/then predictions and know that hypotheses leading to accurate predictions are tentatively accepted, while hypotheses that lead to inaccurate predictions are rejected or discarded.

b. Formulate and clarify the method(s) of investigation, anticipating difficulties or needs for special equipment, time schedules, expenses, safety precautions, etc.

c. Identify appropriate controls and variables in the investigation.

d. Collect, organize, display, and analyze data according to an orderly plan, using data tables, graphs, narrative descriptions, or other methods as appropriate.

e. Compare predictions from hypotheses to data, and revise or discard hypotheses as appropriate.

f. Present results and seek critiques from others.

g. Predict the effect on a dependent variable when an independent variable is altered.

C. Collaborative and safe working practices

1. Collaborate on joint projects.

EXAMPLE

a. Work in teams and share responsibilities, acknowledging, encouraging, and valuing contributions of all team members.

2. **Understand and apply safe procedures in the laboratory and field, including chemical, electrical, and fire safety and safe handling of live or preserved organisms.**

EXAMPLES

a. Use Materials Safety Data Sheet (MSDS) information and demonstrate safe laboratory practices.

b. Apply MSDS information to evaluate and guide safe practices in temporary storage and handling of chemicals in the classroom.

c. Apply safe handling procedures for live and preserved organisms.

3. **Demonstrate skill in the safe use of a wide variety of apparatuses, equipment, techniques, and procedures.**

EXAMPLE

a. Troubleshoot equipment and experimental set-ups under supervision and identify unsafe conditions or practices.

D. Current scientific technology

1. **Demonstrate literacy in computer use.**

EXAMPLE

a. Use a variety of hardware platforms and software applications effectively, including word processing, data analysis and statistics packages, detectors and data-gathering probes, and other peripheral equipment.

2. **Use computer models, applications, and simulations.**

EXAMPLE

a. Use computer models, simulations, databases, visualizations, spreadsheets, and other applications to describe, analyze, and synthesize data and explanatory descriptions of natural phenomena.

3. **Demonstrate appropriate use of a wide variety of apparatuses, equipment, techniques, and procedures for collecting quantitative and qualitative data.**

EXAMPLE

a. Select a device from a given assortment of measuring devices that is most appropriate for data collection and explain why that device was chosen.

E. Effective communication of scientific information

1. **Use several modes of expression to describe or characterize natural patterns and phenomena. These modes of expression include narrative, numerical, graphical, pictorial, symbolic, and kinesthetic.**

EXAMPLE

a. Translate information presented in any of these modes into any other of these modes of expression to produce equivalent statements.

2. **Use essential vocabulary of the discipline being studied.**

EXAMPLE

a. Define and use a basic set of technical terms correctly and in context for each discipline studied.

II. Foundation Skills: Scientific Applications of Mathematics

A. Basic mathematics conventions

1. **Understand the real number system and its properties.**

EXAMPLES

a. Calculate sums, differences, products, and quotients of real numbers.

b. Determine rates from magnitudes (e.g., speed from time and distance) and magnitudes from rates (e.g., the expected number of births if the birth rate and population size are known; the estimated age of an artifact from carbon-14 data).

c. Convert compound units (e.g., kilometers per hour into meters per second).

d. Calculate circumference and area of rectangles, triangles, and circles, and the volumes of rectangular solids.

2. Use exponents and scientific notation.

EXAMPLE

a. Calculate sums, differences, quotients, and products using scientific notation.

3. Understand ratios, proportions, percentages, and decimal fractions, and translate from any form to any other.

EXAMPLES

a. Calculate the relationships among common fractions, decimal fractions, and percentages.

b. Calculate what percentage one number is of another and take a percentage of any number (e.g., 10 percent off, 60 percent gain).

c. Find the reciprocal of any number.

4. Use proportional reasoning to solve problems.

EXAMPLE

a. Solve problems in which the result is expressed as a ratio or proportion of the starting conditions (e.g., predict genotype of parents if traits of offspring are known; starting from a known concentration, calculate the new concentration after serial dilutions; calculate doubling time of a population from growth rate).

5. Simplify algebraic expressions.

EXAMPLE

a. Determine by numeric substitution the value of simple algebraic expressions [e.g., the expressions aX+bY, a(A+B), and (A-B)/(C+D)].

6. Estimate results to evaluate whether a calculated result is reasonable.

EXAMPLES

a. Estimate familiar lengths, weights, and time periods.

b. Estimate distances and travel times from maps.

c. Estimate actual sizes of objects based on scale drawings.

d. Estimate probabilities of outcomes of familiar situations, either on the basis of history (e.g., the fact that a certain football team has won its opening game eight times in the last 10 years) or on the basis of the number of possible outcomes (e.g., there are six sides on a die).

e. Trace the source of any large disparity between the estimate and the calculated answer.

f. Figure out what the unit (e.g., seconds, square centimeters, dollars per tankful) of the answer will be from the inputs to the calculation.

7. Use calculators, spreadsheets, computers, etc., in data analysis.

EXAMPLES

a. Read and follow step-by-step instructions given in calculator manuals when learning new procedures.

b. Make up and write out simple algorithms for solving problems that take several steps.

c. Report the appropriate units with the numerical answer.

d. Judge whether an answer is reasonable by comparing it to an estimated answer.

e. Round off the number appearing in the answer to an appropriate number of significant figures.

f. Demonstrate competency in using scientific notation features on calculators.

B. Mathematics as a symbolic language

1. Carry out formal operations using standard algebraic symbols and formulae.

EXAMPLE

a. Solve for unknown variables in an algebraic equation (e.g., solve for gas pressure, volume, or temperature given an initial set of gas conditions).

2. Represent natural events, processes, and relationships with algebraic expressions and algorithms.

EXAMPLE

a. Translate a narrative into an algebraic expression (e.g., write an equation from a word problem).

C. Understand relationships among geometry, algebra, and trigonometry

1. Understand simple vectors, vector notations, and vector diagrams, and carry out simple calculations involving vectors.

EXAMPLES

a. Carry out simple mathematical operations such as those presented in pre-calculus courses (e.g., determining slopes of lines or rates of change).

b. Convert a numerical vector quantity (e.g., magnitude and direction) into a graphical vector representation.

c. Perform graphical vector addition and subtraction.

2. Understand that a curve drawn on a defined set of axes is fully equivalent to a set of algebraic equations.

EXAMPLES

a. Construct graphs from given equations.

b. Predict the shape of a curve without graphing.

c. Plot the values of a given algebraic equation for a reasonable set of numerical parameters.

3. Understand basic trigonometric principles, including definitions of terms such as sine, cosine, tangent, cotangent, and their relationship to triangles.

EXAMPLE

a. Use sine, cosine, tangent, etc., to carry out numerical and algebraic calculations using these terms.

4. Understand basic geometric principles.

EXAMPLES

a. Use geometric principles to solve problems dealing with molecular angles, optics, and surface area to volume ratios.

b. Compute angle values using various geometric principles including the sum of angles in a triangle, alternate interior angles, and similar triangles.

D. Scientific problem solving

1. Use dimensional analysis in problem solving.

EXAMPLES

a. Use dimensional analysis to facilitate setting up calculations and to judge whether a final solution is reasonable.

b. Convert complex metric units using dimensional analysis (e.g., kilograms per cubic meter to grams per cubic centimeter).

E. Scientific application of probability and statistics

1. Understand descriptive statistics.

EXAMPLES

a. Given a set of data, compute the mean, median, mode, range, standard deviation, standard error, and percent error.

b. Evaluate whether two or more data sets show significant differences by comparing means, standard deviations, and standard errors.

c. Use appropriate statistical tests to evaluate hypotheses.

F. Scientific measurement

1. Select and use appropriate Standard International (SI) units and prefixes to express measurements for real-world problems.

EXAMPLES

a. Know common SI prefixes (pico to tera), their abbreviations, and their associated powers of 10.

b. Use SI base units (e.g., kilograms, meters) and derived units (e.g., liters, joules, grams per cubic centimeter).

c. Understand the relationship and usage of SI and standard English units in daily measurements.

2. Use appropriate significant digits.

EXAMPLES

a. Know the rules for adding, subtracting, multiplying, and dividing measurements using the appropriate number of significant digits.
b. Apply an understanding of significant digits and estimated digits to evaluate and guide selection of appropriate measuring devices.
c. Make measurements using various devices and record data with the correct number of significant figures.
d. Distinguish between accuracy (i.e., closeness to true value), and precision (i.e., reproducibility).

3. Understand and use logarithmic notation (base 10).

EXAMPLES

a. Using log tables or calculators, determine the log of a number between 1 and 10, and determine the value of a number from its logarithm (base 10).
b. Express the value of the log (base 10) of a number greater than 10 or less than 1, using scientific notation.
c. Recognize, without the help of log tables or calculators, the log (base 10) of any power of 10.
d. Add or subtract numbers expressed as logs accurately to determine values represented.
e. Use logarithms for calculations involving numbers less than one or greater than 10 (i.e., numbers expressed with exponents of ten in scientific notation).
f. Calculate the pH of a given molar concentration of an acid or alkaline (basic) solution.

III. Foundation Skills: Scientific Applications of Communication

A. Scientific writing

1. Use correct applications of writing practices in scientific communication.

EXAMPLES

a. Construct word (narrative) descriptions of apparatuses, equipment, techniques and procedures, data, and other features of scientific investigations with sufficient clarity that a layman reader can comprehend and replicate the items or arrangements being described.
b. Write accurate and understandable lab reports and technical documents.
c. Prepare a summary or abstract of a technical article or report, extracting in brief form the pertinent information.
d. Use appropriate terminology and data expression to communicate information in a concise manner.
e. Give credit to original authors including online or electronic sources and never take credit for words that are not one's own.
f. Write a technical report including a bibliography and proper documentation of sources using a standard style.

B. Scientific reading

1. Read technical and scientific articles to gain understanding of interpretations, apparatuses, techniques or procedures, and data.

EXAMPLES

a. Describe the contents of a technical or scientific article.
b. Explain the importance of a technical or scientific article.
c. Make reasonable conclusions or predictions from given scientific article data.

2. Set up apparatuses, carry out procedures, and collect specified data from a given set of appropriate instructions.

EXAMPLE

a. Follow a written procedure to set up and perform a lab activity.

3. Recognize scientific and technical vocabulary in the field of study and use this vocabulary to enhance clarity of communication.

EXAMPLE

a. Identify and define key scientific terminology from technical and scientific documents.

4. List, use and give examples of specific strategies before, during, and after reading to improve comprehension.

EXAMPLES

a. List strategies to use before reading, including: activate prior knowledge of the topic, gain a clear understanding of the goal or purpose of the reading, and analyze the way in which the material is structured.

b. List strategies to use during reading, including: focus attention on the text; anticipate and predict what information the text is likely to contain; monitor understanding by self-questioning and the use of strategies (e.g., mental imagery, paraphrasing, information in glossaries) to re-examine the text if comprehension fails; reread difficult passages or read ahead for additional clarification; seek outside help for clarification; and frequently self-monitor and summarize the information that has been gained.

c. List strategies to use after reading, including: summarize the major points in the text and use graphic organizers (e.g., concept maps, problem-solution diagrams, cycle diagrams) to organize terms and concepts from the text in a visual manner.

C. Presentation of scientific/technical information

1. Prepare and present scientific/technical information in appropriate formats for various audiences.

EXAMPLES

a. Make presentations using posters, spoken words, printed graphics, electronic applications (e.g., MS PowerPoint), and other formats.

b. Present data or explanations extemporaneously without word-by-word reading of a prepared text.

c. Answer questions generated by an oral presentation appropriately.

D. Research skills/information literacy

1. Use search engines, databases, and other digital electronic tools effectively to locate information.

EXAMPLE

a. Use electronic tools to locate relevant information.

2. Evaluate quality, accuracy, completeness, reliability, and currency of information from any source.

EXAMPLES

a. Distinguish relevant and reliable sources from other search results.

b. Develop referencing skills to find needed background information.

IV. Science, Technology, and Society

A. Interactions between innovations and science

1. Recognize how scientific discoveries are connected to technological innovations.

EXAMPLE

a. Give examples of technological innovations that resulted from various scientific discoveries.

B. Social ethics

1. Understand how scientific research and technology have an impact on ethical and legal practices.

EXAMPLES

a. Describe how scientific research and technology have an impact on ethical and legal practices in society.

b. Recognize that honest and complete reporting of data, and fair, logically valid interpretation of data are the hallmarks of good science, and consistently follow these practices.

2. **Understand how commonly held ethical beliefs impact scientific research.**

EXAMPLE

a. Discuss positive and negative influences of commonly held ethical beliefs on scientific practice.

C. History of science

1. **Understand the historical development of major theories in science.**

EXAMPLE

a. Describe and explain the significance of historical development of quantum theory, modern atomic theory, biological evolution, plate tectonics, etc.

2. **Recognize the role of people in important contributions to scientific knowledge.**

EXAMPLE

a. Describe the contribution of selected individuals who have made major contributions to particular disciplines.

V. Cross-Disciplinary Themes

A. Matter/states of matter

1. **Know modern theories of atomic structure.**

EXAMPLES

a. Describe the characteristics and typical locations of sub-atomic particles such as protons, neutrons, and electrons.

b. Describe what happens when an atom becomes an ion.

2. **Understand the typical states of matter (solid, liquid, gas) and phase changes among these.**

EXAMPLES

a. Explain the differences in volume, shape, and strength of attractive forces for each state of matter.

b. Predict changes in the behavior of a gas sample as pressure, volume, or temperature is changed.

c. Identify the conditions under which a compound will be solid, liquid, or gas from a given phase diagram of a compound.

B. Energy (thermodynamics, kinetic, potential, energy transfers)

1. **Understand the Laws of Thermodynamics.**

EXAMPLES

a. Express thermodynamic principles in mathematical or symbolic statements.

b. List and give examples of each law of thermodynamics.

2. **Know the processes of energy transfer.**

EXAMPLES

a. Cite specific examples of such transfer processes in biological, chemical, physical, and geological systems.

b. Compare and contrast kinetic and potential energy.

C. Change over time/equilibrium

1. **Recognize patterns of change.**

EXAMPLES

a. Describe examples of physical and biological systems that remain stable over time, as well as examples of systems that undergo change.

b. Describe feedback mechanisms that lead to stability in a system (homeostasis) and provide examples of such mechanisms.

c. Describe cyclic change in terms of frequency, amplitude (maximum and minimum values), duration, and controlling factors, and illustrate these descriptions with examples of real cycles.

d. Know that things can change in detail but remain the same in general (e.g., players are substituted in and out of the game but the team continues, individual cells are replaced but the organism remains alive), and give discipline-specific examples.

e. Know that in biological systems, present forms arise from the materials and forms of the past both at the individual level (growth/development) and at the population level (evolution/speciation), and in ways that can be explained. Describe examples that illustrate such events and processes.

f. Use graphs, symbolic equations, and other techniques for depicting and analyzing patterns of change.

D. Classification

1. Understand that scientists categorize things according to similarities and differences.

EXAMPLES

a. Correctly use nomenclature for classification.

b. Describe the characteristics of the different domains, kingdoms, and major phyla within the animal and plant kingdoms.

c. Understand the Periodic Table and the atomic characteristics on which it is based.

d. Know the major categories of minerals and describe characteristics that distinguish one from another.

e. Recognize various soil types and the various horizons in soil structure; describe characteristics that distinguish one from the other.

f. Know the Linnaean system of classification, taxonomy of organisms, and alternative classification systems such as cladistics.

g. Distinguish among elements, compounds, and mixtures.

E. Measurements and models

1. Use models to make predictions.

EXAMPLE

a. Create a model of a system and use that model to predict the behavior of a larger system.

2. Use scale to relate models and structures.

EXAMPLE

a. Create a model of a larger system, properly scaling the model.

3. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.

EXAMPLE

a. Compare the order of magnitude estimates for metric sizes of a variety of objects (e.g., atomic nucleus, atom, molecule, grain of sand, pinhead, fingernail, baseball, city, state, country, planet, star).

VI. Biology

A. Structure and function of cells

1. Know that although all cells share basic features, cells differentiate to carry out specialized functions.

EXAMPLES

a. Describe criteria for recognizing different functional cell types and give examples of such types including nervous, epithelial, muscle, and other cells.

b. Name and describe basic cell types found in living organisms.

c. Give examples of particular modifications of cells, and explain how these modifications are related to each type's function in an organism.

d. Recognize and describe major features that distinguish plant, animal, and fungal cells.

2. Explain how cells can be categorized into two major types: prokaryotic and eukaryotic, and describe major features that distinguish one from the other.

EXAMPLE

a. Describe or recognize major features that distinguish prokaryotic from eukaryotic cells.

3. Describe the structure and function of major sub-cellular organelles.

EXAMPLE

a. Describe or recognize the appearance or structure of ribosomes, cytoplasmic membrane, chromosomes, cell wall, eukaryotic nucleus, nucleolus, lysosomes, vacuoles, cytoskeleton, centrioles, cilia, flagella, Golgi apparatus, chloroplasts, mitochondria, and endoplasmic reticulum, and describe important functions of each.

4. Describe the major features of mitosis and relate this process to growth and asexual reproduction.

EXAMPLES

a. Draw, describe, and place in sequence the various stages of mitosis.
b. Identify the stages of mitosis when presented on a microscope slide, computer animation, or drawing during a practical lab exam.
c. Arrange pictures or word descriptions of the stages of mitosis into correct sequence and describe or explain any significant events occurring in each stage.

5. Understand the process of cytokinesis in plant and animal cells and how this process is related to growth.

EXAMPLE

a. Describe the major features and events of cytokinesis with pictures or word descriptions.

6. Know the structure of membranes and how this relates to permeability.

EXAMPLE

a. Describe and explain the processes of osmosis and diffusion, and explain how the structure of plasma membranes permits and influences these events.

B. Biochemistry

1. Understand the major categories of biological molecules: lipids, carbohydrates, proteins, and nucleic acids.

EXAMPLES

a. Describe the role of each type of biological molecule within a living system.
b. Identify a biological molecule based on its formula and structure.
c. Describe the major role of each biological molecule in biological structure and metabolism.

2. Describe the structure and function of enzymes.

EXAMPLES

a. Describe the environmental effects (e.g., pH, temperature) on enzyme activity and explain why these affect enzymes.
b. Give specific examples of enzymes and why they are important in the human body.
c. Describe the chemical structure of proteins, including amino acids, peptide bonds, and polypeptide formation.
d. Describe the effects of enzymes on reaction rates, including effects on activation energy requirements.

3. Describe the major features and chemical events of photosynthesis.

EXAMPLES

a. Explain the importance of chlorophyll.
b. Describe patterns of electron flow through light reaction events.
c. Describe significant features of the Calvin cycle.

4. Describe the major features and chemical events of cellular respiration.

EXAMPLES

a. Describe what Adenosine Triphosphate (ATP) is and its importance as an energy carrier molecule.
b. Describe major features of glycolysis, Krebs cycle, electron transport system, and chemiosmosis.

5. Know how organisms respond to presence or absence of oxygen, including mechanisms of fermentation.

EXAMPLES

a. Conduct lab experiments regarding fermentation, respiration, and photosynthesis.
b. Describe the role of oxygen in respiration and describe pathways of electron flow in the absence of oxygen.
c. Explain the advantages and disadvantages of fermentation and aerobic respiration.

6. Understand coupled reaction processes and describe the role of ATP in energy coupling and transfer.

EXAMPLE

a. Describe reactions that produce and consume ATP.

C. Evolution and populations

1. Know multiple categories of evidence for evolutionary change and how this evidence is used to infer evolutionary relationships among organisms.

EXAMPLE

a. Describe features of biogeography/plate tectonics, fossil record, metabolism, DNA/protein sequences, homology, embryology, artificial selection/agriculture, and antibiotic resistance that contribute to our understanding of evolutionary change.

2. Recognize variations in population sizes, including extinction, and describe mechanisms and conditions that produce these variations.

EXAMPLES

a. Describe mechanisms that produce variations in population sizes.

b. Recognize, describe, and explain typical patterns of change in population size (e.g., the logistic growth curve).

c. Describe particular examples of extinction and describe conditions that produced these extinctions (e.g., Permian, Cretaceous dinosaur, wooly mammoth, passenger pigeon).

d. Know that populations of organisms have changed, and continue to change over time, showing patterns of descent with modification from common ancestors to produce the organismal diversity observed today.

e. Describe general features of the history of life on Earth, including generally accepted dates and sequence of the geologic time scale and characteristics of major groups of organisms present during these time periods.

f. Describe mechanisms that produce change in populations from generation to generation (e.g., artificial selection, natural selection, genetic drift, mutation, recombination).

g. Describe and explain processes and major events in natural selection, genetic drift, mutation, etc., and distinguish these processes from each other.

D. Molecular genetics and heredity

1. Understand Mendel's laws of inheritance.

EXAMPLES

a. Describe the laws of Mendelian genetics.

b. Predict outcomes of a variety of test crosses and be able to predict parental genotypes for offspring.

c. Use the laws of inheritance to carry out numerical calculations analyzing and predicting genetic characteristics of parents and offspring.

d. Read a "genetics problem" and identify the information needed to complete a Punnett square.

e. Determine phenotypes and genotypes of offspring from a given set of data about parental phenotypes and/or genotypes, expressing these features in numerical terms for cases of monohybrid and dihybrid crosses and other typical cases.

f. Determine phenotypes and genotypes of parents from a given set of data about offspring phenotypes and/or genotypes, expressing these features in numerical terms.

2. Know modifications to Mendel's laws.

EXAMPLE

a. Determine phenotypes and genotypes of offspring from a given data set about parental phenotypes and/or genotypes; express these features in numerical terms for cases of co-dominance, quantitative inheritance, sex-linked traits, and other typical cases.

3. Understand the molecular structures and functions of nucleic acids.

EXAMPLES

a. Research a genetic disorder and describe the cause of the disorder.

b. Describe in words or pictures the molecular structure of DNA, RNA, and proteins.

c. Describe in words or pictures the molecular events of replication, transcription, translation, and mutation.

d. Describe the events and processes of molecular genetics: DNA controls synthesis of several types of RNA, RNA molecules plus proteins cooperate to synthesize new proteins, and proteins control structure and metabolism of cells.

e. Describe the processes of electrophoresis and polymerase chain reaction, and explain their function in identifying DNA, RNA, and proteins.

4. Understand simple principles of population genetics and describe characteristics of a Hardy-Weinberg population.

EXAMPLES

a. Calculate phenotypes and genotypes of offspring populations from a given set of data about phenotypes and/or genotypes present in a population, using the Hardy-Weinberg equations.

b. Describe and explain features of a population that must be present in order for Hardy-Weinberg calculations to be accurate.

5. Describe the major features of meiosis and relate this process to Mendel's laws of inheritance.

EXAMPLES

a. Explain the events of meiosis and the significance of these events to maintain chromosomal numbers.

b. Explain how the events of meiosis produce the genetic effects described by Mendel's laws of inheritance.

c. Arrange pictures or word descriptions of the stages of meiosis into their correct sequence and describe or explain any significant events occurring in each stage.

d. Compare and contrast mitosis and meiosis.

E. Classification and taxonomy

1. Know ways in which living things can be classified based on each organism's internal and external structure, development, and relatedness of DNA sequences.

EXAMPLES

a. Explain the relationship between DNA sequences and physical characteristics.

b. Describe the characteristics of each taxon and explain the significance in separating organisms.

c. Distinguish similarities and differences among a given set of pictures or drawings of vertebrates during their development.

d. Describe species diversity and cladistics, including the types of evidence and procedures that can be used to construct diagrams (e.g., phylogenetic trees).

e. Construct cladograms and/or phylogenetic trees from simple data sets for major groups of organisms.

f. Determine the correct classification and taxonomy of organisms from narrative or pictorial descriptions.

F. Systems and homeostasis

1. Know that organisms possess various structures and processes (feedback loops) that maintain steady internal conditions.

EXAMPLES

a. Describe examples of organisms that possess various structures and processes (feedback loops) that maintain steady internal conditions.

b. Describe examples of homeostasis (e.g., temperature regulation, osmotic balance, glucose levels) and describe the major features of feedback loops that produce such homeostasis.

2. Describe, compare, and contrast structures and processes that allow gas exchange, nutrient uptake and processing, waste excretion, nervous and hormonal regulation, and reproduction in plants, animals, and fungi; give examples of each.

EXAMPLES

a. Describe common gas exchange systems in plants and animals including anatomical features and functions.

b. Describe common nutrient acquisition systems in plants, animals, and fungi, including anatomical features and functions.

c. Describe common waste excretion systems in plants and animals, including anatomical features and functions.

d. Describe common nervous/hormonal control systems in plants and animals, including anatomical features and functions.

e. Describe common reproductive systems in plants, animals, and fungi, including anatomical features and functions.

G. Ecology

1. Identify Earth's major biomes, giving their locations, typical climate conditions, and characteristic organisms.

EXAMPLE

a. Name and describe Earth's major biomes, including tundra, boreal forests, temperate deciduous forests, grasslands, deserts, tropical rain forests, estuaries and other wetlands, and marine biomes, including their typical locations, the typical organisms found in each, and important physical factors (e.g., temperature, rainfall rates) that produce these distribution patterns.

2. Know patterns of energy flow and material cycling in Earth's ecosystems.

EXAMPLES

a. Describe patterns of energy flow and nutrient cycling through ecosystems.

b. Describe and explain a trophic pyramid, including descriptions of typical organisms to be found at each trophic level in an ecosystem.

c. Describe patterns of energy flow and nutrient cycling through ecosystems including the role of microorganisms.

3. Understand typical forms of organismal behavior.

EXAMPLE

a. Describe and give examples of organismal behavior (e.g., fixed action patterns, releasers, fight-or-flight responses, territorial displays, circadian rhythms).

4. Know the process of succession.

EXAMPLE

a. Describe events and processes that occur in succession, including changes in organismal populations, species diversity, and life history patterns over the course of succession.

VII. Chemistry

A. Matter and its properties

1. Know that physical and chemical properties can be used to describe and classify matter.

EXAMPLES

a. Distinguish between physical properties (e.g., density, melting point) and chemical properties (e.g., ability to react, combustibility). Know that chemical changes create new substances (e.g., rusting), while physical changes do not (e.g., boiling).

b. Understand that, as an intrinsic property, density does not change as sample size is changed, and be able to perform density calculations.

2. Recognize and classify pure substances (elements, compounds) and mixtures.

EXAMPLES

a. Describe separation techniques for both mixtures and compounds.

b. Distinguish between homogeneous and heterogeneous mixtures.

c. Understand that, as an intrinsic property, density does not change as sample volume is changed, and be able to perform density calculations.

B. Atomic structure

1. Summarize the development of atomic theory. Understand that models of the atom are used to help understand the properties of elements and compounds.

EXAMPLES

a. Describe the discoveries of Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus), and Bohr (planetary model of the atom); understand how each discovery contributed to modern atomic theory.

b. Identify the masses, charges, and locations of the major components of the atom (protons, neutrons, and electrons); describe Rutherford's "gold foil" experiment that led to the discovery of the atomic nucleus; and describe Millikan's "oil drop" experiment that led to determining the charge on an electron.

c. Describe basic wave properties (calculate wavelength, frequency, or energy of light) and understand that electrons can be described by the physics of waves.

d. Explain the importance of quantized electron energy and its relationship to atomic emission spectra.

e. Understand the electron configuration in atoms (Aufbau principle, the Pauli exclusion principle, Hund's rule) and their connection with the periodic table.

C. Periodic table

1. Know the organization of the periodic table.

EXAMPLES

a. Identify periods and groups on the periodic table.

b. Identify metals, metalloids, and non-metals on the periodic table.

c. Distinguish between and describe patterns in electron configurations for representative elements, transition elements, inner-transition elements, and noble gases. Predict the common charges on the representative elements from the periodic table.

2. Recognize the trends in physical and chemical properties as one moves across a period or vertically through a group.

EXAMPLES

a. Define and describe the periodic trend: atomic radii, ionic radii, ionization energy, electron affinity, and electronegativity.

b. Use the periodic trends to compare the size and behavior of atoms and ions.

D. Chemical bonding

1. Characterize ionic bonds, metallic bonds, and covalent bonds. Describe the properties of metals and ionic and covalent compounds.

EXAMPLES

a. Draw Lewis dot structures for simple molecules, including simple hydrocarbons.

b. Use Valence Shell Electron Pair Repulsion (VSEPR) model to predict molecular shapes.

c. Describe nonpolar and polar covalent bonds. Use a chart of electronegativities to determine bond polarity.

d. Determine if a molecule is polar (contains a dipole moment).

E. Chemical reactions

1. Classify chemical reactions by type. Describe the evidence that a chemical reaction has occurred.

EXAMPLES

a. Write equations for chemical reactions using appropriate symbols and balance the equations by applying the Law of Conservation of Mass. Write net ionic equations.

b. Predict the products of a reaction that fall within the five general types of chemical reactions (synthesis, decomposition, single replacement, double replacement, and combustion).

c. Use an activity series to predict whether a single replacement reaction will occur.

d. Use solubility rules to determine the precipitate formed in a double replacement precipitation reaction.

2. Describe the properties of acids and bases and identify the products of a neutralization reaction.

EXAMPLES

a. Define pH and describe acid and base solutions in terms of pH. Use hydrogen ion or hydroxide ion concentrations to determine the pH of an acid or base solution.

b. Use both commercial and non-commercial indicators to identify acid, base, and neutral solutions in a lab experiment.

c. Distinguish between the Arrhenius and Brønsted definitions of acids and bases. Identify conjugate acid-base pairs.

d. Describe how a titration is performed and how this process can be used to determine the concentration of an unknown acid or base solution.

e. Measure and compare the pH of various common acids and bases (e.g., household cleaners, vinegar, citrus juice).

3. Understand oxidation-reduction reactions.

EXAMPLES

a. Differentiate between oxidation and reduction, and between oxidizing agent and reducing agent.

b. Understand the consequences of corrosion processes and define and describe the electroplating process.

c. Determine the oxidation number of any atom in an element, ion, or compound.

4. Understand chemical equilibrium.

EXAMPLES

a. Identify the factors that cause a shift in equilibrium (e.g., temperature, concentration, volume, pressure).

b. Explain LeChatelier's principle and use this principle to predict changes in the equilibrium position of a reaction.

5. Understand energy changes in chemical reactions.

EXAMPLES

a. Distinguish between endothermic and exothermic reactions. Draw energy diagrams for endothermic and exothermic reactions.

b. Describe the Law of Conservation of Energy.

6. Understand chemical kinetics.

EXAMPLES

a. Describe collision theory and use this theory to explain effects of concentration, temperature, and nature of reactants on reaction rate.

b. Define catalyst and describe how a catalyst affects a reaction rate.

F. Chemical nomenclature

1. Know formulas for ionic compounds.

EXAMPLE

a. Name and write formulas for binary and ternary ionic compounds, using Group A (representative) metals and Group B (transition) metals, including those containing common polyatomic ions (e.g., nitrate, sulfate, carbonate, ammonium, phosphate, hydroxide).

2. Know formulas for molecular compounds.

EXAMPLES

a. Name and write formulas for binary molecular compounds and acids.

b. Categorize a compound as ionic or molecular.

G. The mole and stoichiometry

1. Understand the mole concept.

EXAMPLE

a. Use Avogadro's number and molar mass to convert to moles of a substance. Determine the percent composition of a compound. Calculate the empirical formula of a compound from mass or percent composition data.

2. **Understand molar relationships in reactions, stoichiometric calculations, and percent yield.**

EXAMPLES

a. Construct mole ratios for a reaction to calculate the reactant amounts needed or product amounts formed in terms of moles or mass.

b. Calculate percent yield, theoretical yield, or actual yield for a reaction.

H. Thermochemistry

1. **Understand the Law of Conservation of Energy and processes of heat transfer.**

EXAMPLES

a. Distinguish among radiation, convection, and conduction as means of heat transfer.

b. Describe processes of heat transfer.

c. Perform calculations involving heat transfer, using specific heat and latent heat (phase changes).

2. **Understand energy changes and chemical reactions.**

EXAMPLES

a. Describe and give examples of renewable and non-renewable energy resources.

b. Describe endothermic and exothermic reactions.

c. Know that systems naturally tend to move in a direction that increases disorder or randomness (entropy).

I. Properties and behavior of gases, liquids, and solids

1. **Understand the behavior of matter in its various states: solid, liquid, and gas.**

EXAMPLES

a. Describe how gas pressure is affected by volume, temperature, and the addition of gas.

b. Describe the behavior of solids, liquids, and gases under changes in pressure.

2. **Understand properties of solutions.**

EXAMPLES

a. Describe factors affecting solubility, units of concentration, colligative properties, and colloids.

b. Calculate the molarity and molality of solutions.

c. Determine boiling point elevation and freezing point depression for a solution.

3. **Understand principles of ideal gas behavior and kinetic molecular theory.**

EXAMPLES

a. Use kinetic molecular theory to explain how gas pressure is affected by volume, temperature, and the addition of gas.

b. Distinguish between real and ideal gas behavior, and identify the criteria in the kinetic molecular theory that conflict with the properties of real gases.

4. **Apply the concept of partial pressures in a mixture of gases.**

EXAMPLE

a. Use Dalton's Law to determine the partial pressure of a gas in a mixture of gases.

5. **Know properties of liquids and solids.**

EXAMPLES

a. Describe the properties of liquids (e.g., surface tension, capillary action).

b. Describe the structure of solids (e.g., crystal lattice structure, unit cell, amorphous solids).

6. **Understand the effect of vapor pressure on changes in state; explain heating curves and phase diagrams.**

EXAMPLES

a. Define boiling, freezing, sublimation, etc.

b. Explain heating curves and phase diagrams.

7. **Describe intermolecular forces.**

EXAMPLE

a. Distinguish between dispersion forces, dipole interactions, and hydrogen bonding. Identify the most important intermolecular force acting on a substance.

J. Basic structure and function of biological molecules: proteins, carbohydrates, lipids, and nucleic acids

1. Understand the major categories of biological molecules: proteins, carbohydrates, lipids, and nucleic acids.

EXAMPLE

a. Recognize each type of biological molecule by its structural formula, and describe simple chemical tests or procedures to detect, identify, or characterize each type.

K. Nuclear chemistry

1. Understand radioactive decay.

EXAMPLES

a. Identify the types of radioactive decay particles that occur, compare their properties (e.g., mass, charge, composition, penetrating ability), and write equations representing the decay processes.

b. Explain the concept of half-life for a radioisotope, and use this concept to determine the amount of a certain sample of radioisotope remaining after a period of time, given the length of the half-life.

c. Determine the length of time that has passed, given the remaining amount of radioisotope, the original amount of radioisotope, and the length of the half-life.

d. Explain how carbon-14 is used to date artifacts.

e. Compare and contrast the nuclear processes of fission and fusion.

VIII. Physics

A. Matter

1. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.

EXAMPLE

a. Compare order of magnitude estimates for metric sizes of a variety of objects (e.g., atomic nucleus, atom, molecule, grain of sand, pinhead, fingernail, baseball, city, state, country, planet, star).

2. Understand states of matter and their characteristics.

EXAMPLES

a. Describe the states of matter in terms of volume, shape, and cohesive strength.

b. State the physical changes associated with a change in phase.

3. Understand the concepts of mass and inertia.

EXAMPLES

a. Describe the concept of mass as a measurement of inertia.

b. Compare order of magnitude estimates for masses of a variety of objects (e.g., electron, grain of sand, pebble, baseball, person, car, planet, star).

4. Understand the concept of density.

EXAMPLES

a. Define density as the ratio of mass to volume. Apply the definition to calculate mass, volume, or density given two of the three quantities.

b. Calculate density of a homogeneous material and use it to identify the material.

5. Understand the concepts of gravitational force and weight.

EXAMPLES

a. Qualitatively and quantitatively describe Newton's Law of Gravitation and the factors that affect the gravitational force between two objects.

b. Describe weight as a force of attraction to a large body and make computations of weight (using W=mg).

c. Give examples to differentiate between mass and weight.

B. Vectors

1. Understand how vectors are used to represent physical quantities.

EXAMPLES

a. State several examples of scalar quantities.

b. State several examples of vector quantities.

c. Convert a numerical vector quantity (magnitude and direction) into a graphical vector representation.

2. Demonstrate knowledge of vector mathematics using a graphical representation.

EXAMPLES

a. Resolve a vector quantity (magnitude and direction) into perpendicular components using paper, a ruler, and a protractor.

b. Add and subtract various vectors using paper, a ruler, and a protractor.

3. Demonstrate knowledge of vector mathematics using a numerical representation.

EXAMPLES

a. Resolve a numerical vector quantity (magnitude and direction) into perpendicular components using trigonometric functions and a calculator.

b. Add and subtract various vectors using trigonometric functions and a calculator.

C. Forces and motion

1. Understand the fundamental concepts of kinematics.

EXAMPLES

a. State the definitions for displacement, distance, velocity, speed, and acceleration.

b. Solve problems involving displacement, distance, velocity, speed, and acceleration.

c. Solve one-dimensional kinematics problems for the case of constant acceleration.

d. Create and interpret graphs of one-dimensional motion (e.g., position vs. time, velocity vs. time).

e. Describe two-dimensional trajectory motion qualitatively and quantitatively.

f. Describe the concept of relative motion and define a frame of reference.

2. Understand forces and Newton's Laws.

EXAMPLES

a. State Newton's Laws of Motion and demonstrate understanding of their application through lab activities.

b. Solve for an unknown quantity using Newton's Second Law and the concept of equilibrium.

c. Distinguish qualitatively between static and kinetic friction, and describe their effects on the motion of objects.

3. Understand the concept of momentum.

EXAMPLES

a. Define and calculate momentum and impulse. Clearly indicate how momentum is a vector.

b. State the conditions under which momentum is conserved.

c. Describe the term "impulse" in terms of force, time, and momentum. Illustrate the principle of impulse by citing several examples.

d. Solve problems using impulse and the conservation of momentum.

D. Mechanical energy

1. Understand potential and kinetic energy.

EXAMPLES

a. Calculate potential energy values for various types of potential energy (gravitational, elastic, electrical).

b. Calculate kinetic energy values (translational, rotational).

c. Using a diagram of a pendulum or another energy conserving system, identify potential and kinetic energy at various locations.

2. Understand conservation of energy.

EXAMPLES

a. Describe the conversion of potential energy into kinetic energy (and vice-versa) in closed systems for which only conservative forces are present.

b. Describe the conversion of energy in systems in which dissipative forces are present.

c. Describe the general conservation of energy.

3. Understand the relationship of work and mechanical energy.

EXAMPLES

a. Compute net work as the product of net force and displacement, as the change in kinetic energy, and as the negative change in potential energy.

b. Describe the concept of power and calculate average power.

c. Distinguish between energy and power qualitatively, and state the dimensional units for each.

E. Rotating systems

1. Understand rotational kinematics.

EXAMPLES

a. Describe the relationships between the concepts and equations used for translational motion and those used for rotational motion.

b. Define qualitatively: angular displacement, angular velocity, and angular acceleration.

c. Complete computations including angular displacement, angular velocity, angular acceleration, tangential acceleration, and centripetal (radial) acceleration.

d. Use examples to illustrate differences between tangential acceleration and centripetal (radial) acceleration.

e. Explain why a net force (called centripetal) is required in order for an object to move in a circular path.

2. Understand the concept of torque.

EXAMPLES

a. Describe the concept of torque and compute torque values for various situations.

b. Describe the concept of moment of inertia and compute moment of inertia values for various objects.

c. Perform calculations using Newton's Second Law of Motion as applied to rotation.

3. Apply the concept of static equilibrium.

EXAMPLES

a. Describe the two conditions for which an object is in static equilibrium.

b. Construct an equation using the concept of static equilibrium and solve for an unknown quantity.

4. Understand angular momentum.

EXAMPLES

a. Describe the concept of angular momentum.

b. Describe changes in angular velocity when moment of inertia changes.

F. Fluids

1. Understand pressure in a fluid and its applications.

EXAMPLES

a. Define pressure and make basic pressure computations using pressure=force/area in appropriate units.

b. Describe qualitatively and quantitatively how the pressure in a fluid changes with depth and explain the physical basis for the relationship.

c. Describe the cause of atmospheric pressure and its variations.

2. Understand Pascal's Principle.

EXAMPLES

a. Describe and calculate changes in fluid pressure when external pressure is applied, especially as observed in hydraulic systems.

b. Show how Pascal's Principle applies to hydraulic systems and calculate forces on both sides of a hydraulic system.

3. Understand buoyancy.

EXAMPLES

a. Define buoyant force and state Archimedes' Principle.

b. Draw all the forces acting on an object submerged in a fluid. Discuss the conditions for sinking and floating in terms of the forces in the diagram.

4. Understand Bernoulli's principle.

EXAMPLE

a. Qualitatively describe the relationship between fluid speed and fluid pressure in a closed system.

G. Oscillations and waves

1. Understand basic oscillatory motion and simple harmonic motion.

EXAMPLES

a. Identify examples of oscillatory motion.

b. Recognize examples of simple harmonic motion.

2. Understand the difference between transverse and longitudinal waves.

EXAMPLE

a. Describe the motion of the medium as compared to the wave motion for both transverse and longitudinal waves.

3. Understand wave terminology: wavelength, period, frequency, and amplitude.

EXAMPLES

a. Perform computations using the formula (wave speed)=(wavelength)*(frequency).

b. Describe wavelength, period, frequency, and amplitude, and identify each from various wave graphs.

4. Understand the properties and behavior of sound waves.

EXAMPLES

a. Describe the properties and behavior of sound including compressions, rarefactions, and travel through various media.

b. Compare and contrast sound and electromagnetic waves in terms of wave speed, wave type, wavelength, frequency, and medium.

c. Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler Effect).

H. Thermodynamics

1. Understand the gain and loss of heat energy in matter.

EXAMPLES

a. Describe, qualitatively and quantitatively, the relationship between heat and change in temperature, including the effects of mass and specific heat.

b. Identify and compute the energy involved in changes of state.

c. Explain the relationships among evaporation, condensation, cooling, and warming.

d. Describe the transfer of heat by conduction, convection, and radiation.

2. Understand the basic laws of thermodynamics.

EXAMPLES

a. State and describe the laws of thermodynamics.

b. Describe qualitative applications of the laws of thermodynamics and relate each to the concept of conservation of energy.

I. Electromagnetism

1. Discuss electric charge and electric force.

EXAMPLES

a. Describe electrical repulsion and attraction.

b. State Coulomb's Law and use it to compute electrical force.

c. Describe the concept of an electric field.

2. Gain qualitative and quantitative understandings of voltage, current, and resistance.

EXAMPLES

a. Describe the concept of electric potential.

b. Describe the concept of electrical charge flow and what limits that flow.

c. Describe the concept of electrical resistance to charge flow.

3. Understand Ohm's Law.

EXAMPLES

a. Solve for unknown quantities using Ohm's Law.

b. Determine electrical resistance from graphs of voltage versus current.

4. Apply the concept of power to electricity.

EXAMPLE

a. Define electrical power as the product of current and voltage; perform simple calculations of power consumption.

5. Discuss basic DC circuits that include voltage sources and combinations of resistors.

EXAMPLES

a. Summarize the electrical characteristics (current, voltage, total resistance) of a circuit consisting of two or more resistors wired in series.

b. Summarize the electrical characteristics (e.g., current, voltage) of a circuit consisting of two or more resistors wired in parallel.

c. Compare the electrical characteristics (e.g., current, voltage) of a circuit consisting of two or more resistors wired in parallel with those of the same components wired in series.

6. Discuss basic DC circuits that include voltage sources and combinations of capacitors.

EXAMPLES

a. Describe what a capacitor is and how it works.

b. Summarize the electrical characteristics (e.g., current, voltage) of a DC circuit consisting of a battery and a capacitor.

c. Summarize the electrical characteristics (e.g., current, voltage) of a DC circuit consisting of a capacitor and a resistor wired in series.

7. Understand magnetic fields and their relationship to electricity.

EXAMPLES

a. Describe the force experienced by a moving electric charge in a magnetic field.

b. Describe moving electrical charge as the source of magnetic fields.

c. Describe Faraday's Law and Lenz's Law.

d. Describe the source of magnetism in matter.

e. State the law of magnetic poles.

8. Relate electricity and magnetism to everyday life.

EXAMPLES

a. Explain how an electric motor works. State which electromagnetic laws or principles govern the workings of a motor.

b. Explain how an electric generator works. State which electromagnetic laws or principles govern the workings of a generator.

c. Make quantitative predictions of whether or not a circuit breaker will "trip" when a variety of electrical appliances are in use.

J. Optics

1. Know the electromagnetic spectrum.

EXAMPLES

a. Discuss the regions of the electromagnetic spectrum, including radio waves, microwaves, infrared, visible, ultraviolet, x-rays, and gamma rays.

b. Discuss visible light as part of the electromagnetic spectrum. Emphasize that light is an electromagnetic wave.

c. Recognize that electromagnetic waves are transverse waves and travel at the speed of light through a vacuum.

d. Compare and contrast transmission, reflection, and absorption of radiation.

2. Understand the wave/particle duality of light.

EXAMPLES

a. Describe the behavior of light and why scientists have chosen to model it as both a particle and a wave.

b. Give a practical example that illustrates light acting as a wave. Give a practical example that illustrates light acting as a particle.

3. Understand concepts of geometric optics.

EXAMPLES

a. Predict the path of a reflected light ray by applying the law of reflection to both diffuse and specular reflection.

b. Define index of refraction. Predict the path of a light ray through a transparent material by application of Snell's Law.

c. Identify convex, concave, and plane mirrors.

d. Identify convex and concave lenses.

e. Discuss qualitatively the images formed by mirrors and single lenses.

f. Discuss qualitatively the images formed by combinations of mirrors and lenses (e.g., telescopes, microscopes, cameras).

IX. Earth and Space Sciences

A. Earth systems

1. Know the major features and characteristics of atmosphere, geosphere, hydrosphere, and biosphere.

EXAMPLES

a. Describe major components and interactions within the atmosphere: gas composition, temperatures at various levels, ozone formation, and breakdown.

b. Describe characteristics that identify and distinguish the core, mantle, and crust, including their locations, compositions, interactions with each other, and changes through time.

c. Describe major components and interactions within the hydrosphere (the global ocean and its components).

d. Describe major components and interactions within the biosphere, including major biogeochemical cycles (e.g., carbon cycle, oxygen-water cycle, nitrogen cycle, sulfur cycle, flow and storage of energy).

2. Understand relationships and interactions among atmosphere, geosphere, hydrosphere, and biosphere.

EXAMPLES

a. Describe interactions between oceans and climate.

b. Describe effects of catastrophic events (e.g., volcanoes, earthquakes) on Earth systems.

c. Describe impacts of the oceans on the Earth system (e.g., how the Earth's geologic history and present structure would have differed if the ocean had never formed).

d. Describe effects of biological activity on the atmosphere (e.g., CO_2 levels, O_2 levels).

e. Describe major effects of solar activity on the Earth's atmosphere and hydrosphere, including climate, ocean circulation, ozone formation, etc.

3. Possess a scientific understanding of the history of Earth's systems.

EXAMPLES

a. Describe methods and techniques for absolute and relative dating of geologic events and deposits.

b. Describe general features of the geological history of Earth, including generally-accepted dates and sequence of the geologic time scale, physical and chemical conditions prevailing on Earth at different times, and major extinction events among organisms during these time periods.

c. Explain how different surface processes (e.g., volcanism, erosion, tectonics, cratering) affect the planetary surface.

4. Utilize the tools scientists use to study and understand the Earth's systems.

EXAMPLE

a. Use remote sensing tools (e.g., maps, visualizations, satellites, GPS/GIS, seismographs, weather balloons, buoys) and the data they provide.

B. Sun, Earth, and moon system

1. Understand interactions among the sun, Earth, and moon.

EXAMPLE

a. Describe solar system processes that produce phases of the moon, solar and lunar eclipses, seasons, and tides.

2. Possess a scientific understanding of the formation of the Earth and moon.

EXAMPLE

a. Describe current scientific theories and evidence for the origin of Earth and its moon.

C. Solar system

1. Describe the structure and motions of the solar system and its components.

EXAMPLE

a. Identify and describe the major components of the solar system (e.g., star, planets, comets, dwarf planets, kuiper objects, asteroids).

2. Possess a scientific understanding of the formation of the solar system.

EXAMPLES

a. Describe the formation of the sun and the evidence that supports our understanding of this process.

b. Explain the differences between the formation of rocky and gaseous planets.

D. Origin and structure of the universe

1. Understand scientific theories for the formation of the universe.

EXAMPLES

a. Describe current scientific theories and evidence for the origin of the universe (the Big Bang) and formation of galaxies (Red Shift observations).

b. Describe the life cycle of stars using the Hertzsprung-Russell diagram.

2. Know the current scientific descriptions of the components of the universe.

EXAMPLES

a. Describe types of galaxies and the characteristics that distinguish them.

b. Describe general features of quasars and pulsars and the characteristics that distinguish them.

E. Plate tectonics

1. Describe the evidence that supports the current theory of plate tectonics.

EXAMPLES

a. Describe general features of the Earth's interior.

b. Describe the role of convection currents in plate motion.

2. Identify the major tectonic plates.

EXAMPLE

a. Locate and identify the major tectonic plates and plate boundaries on a map.

3. Describe the motions and interactions of tectonic plates.

EXAMPLE

a. Describe the geologic features that result from convergent, divergent, and transformed plate boundaries.

4. Describe the rock cycle and its products.

EXAMPLES

a. Identify common rocks and rock-forming minerals.

b. Classify and describe the formation of rocks (igneous, metamorphic, sedimentary).

F. Energy transfer within and among systems

1. Describe matter and energy transfer in the Earth's systems.

EXAMPLE

a. Describe Earth's principal sources of internal and external energy (e.g., radioactive decay, gravity, solar energy).

2. Give examples of effects of energy transfer within and among systems.

EXAMPLES

a. Describe energy sources and energy transfer processes (e.g., convection, conduction, radiation) that produce thunderstorms, hurricanes, tornadoes, and other weather events.

b. Provide examples of how the uneven heating of Earth influences global circulation patterns (e.g., currents, winds, weather).

c. Describe the effects of ocean currents on weather patterns.

d. Describe the effects of large impacts on geological structures and atmospheric conditions, and cite examples of evidence of large impacts in Earth's history.

X. Environmental Science

A. Earth systems

1. Recognize the Earth's systems.

EXAMPLE

a. Describe the characteristics that identify and distinguish the geosphere, atmosphere, hydrosphere, and biosphere.

2. Know the major features of the geosphere and the factors that modify them.

EXAMPLES

a. Describe the characteristics that identify and distinguish the core, mantle, crust, and tectonic plates, including their locations, compositions, interactions among them, and changes through time.

b. Describe processes of weathering, erosion, deposition, etc., that make up the rock cycle.

c. Describe factors such as earthquakes, volcanoes, and other natural disasters and their impact on the size and location of populations of organisms, and the habitats they occupy.

3. Know the major features of the atmosphere.

EXAMPLES

a. Describe the physical and chemical characteristics that identify different regions of the atmosphere.

b. Describe the factors that influence weather and climate, including atmospheric circulation, Coriolis Effect, and atmosphere-ocean interactions.

4. Know the major features of the hydrosphere.

EXAMPLES

a. Describe the composition and location of bodies of salt water and fresh water.

b. Describe patterns of ocean circulation, including currents and upwellings.

5. Be familiar with Earth's major biomes.

EXAMPLES

a. Name and describe Earth's major terrestrial and aquatic biomes, including their locations, the characteristic organisms found in each, and important physical factors (e.g., temperature, rain fall) that produce these distribution patterns.

b. Describe the adaptations of organisms found in each biome.

6. Describe the Earth's major biogeochemical cycles.

EXAMPLE

a. Describe the carbon, oxygen-water, sulfur, nitrogen, and phosphorus cycles, including the chemical forms of each element at each stage of the cycle, and the chemical patterns of winds and ocean currents and provide information about changes in these patterns during events such as El Niño/La Niña.

B. Energy

1. Understand energy transformations.

EXAMPLES

a. Describe patterns of winds and ocean currents and provide information about changes in these patterns during events such as El Niño/La Niña.

b. Describe how energy flows through the Earth's ecosystems while materials cycle repeatedly within these systems (e.g., food chains and webs, trophic levels, niches, predator-prey interactions, succession).

2. Know the various sources of energy for humans and other biological systems.

EXAMPLES

a. Describe the major sources of energy, including fossil fuels, geothermal sources, wind energy, solar energy, nuclear energy, and others.

b. Describe methods and practices of energy conservation.

C. Populations

1. Recognize variations in population sizes, including human population and extinction, and describe mechanisms and conditions that produce these variations.

EXAMPLES

a. Describe and explain carrying capacity, cultural and economic influences, urbanization, distribution, loss of biodiversity, endangered plants and animals, and deforestation.

b. Explain how the demographic structure of a population, birth and death rates, doubling times, and demographic transitions affect or produce changes in population size and composition.

c. Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity within a population.

D. Economics and politics

1. Name and describe major environmental policies and legislation.

EXAMPLE

a. Describe and explain the goals and provisions of the Clean Water Act, the Endangered Species Act, and other major environmental policies and legislation.

2. Understand the types, uses, and regulations of the various natural resources.

EXAMPLE

a. Name the major U.S. National Parks and Monuments, stating where each is located, and the important features of each that justify protection.

E. Human practices and their impacts

1. Describe the different uses for land (land management).

EXAMPLE

a. Describe features of landscape and geology that lead different locations to be used for different purposes (e.g., agriculture, mining, recreation, urban settlement).

2. Understand the use and consequences of pest management.

EXAMPLE

a. Describe major types of pesticides and herbicides, and other methods of controlling pests (e.g., biocontrol, genetically-modified organisms).

3. Know the different methods used to increase food production.

EXAMPLE

a. Describe the features that identify and distinguish intensive agriculture, sustainable agriculture, organic agriculture, and other food and fiber production methods, including genetically-modified organisms and livestock practices.

4. Understand land and water usage and management practices.

EXAMPLES

a. Describe forestry practices (e.g., tree plantations, fire management).

b. Describe rangeland management practices (e.g., grazing practices, conversion to grasslands, federal regulation).

c. Describe management of urban land development, transportation infrastructure, public lands, and land conservation options.

d. Describe regulation and management of mining practices.

e. Describe regulation and management of fishing practices.

5. Understand how human practices affect air, water, and soil quality.

EXAMPLES

a. Describe the formation and effects of acid deposition, ozone depletion, greenhouse effect, and global warming.

b. Describe different methods of managing waste.

c. Describe the essential components and features of recycling, reuse, remediation, renew, landfills, wastewater, and water recycling.

Social Studies Standards

with performance indicators

I. Interrelated Disciplines and Skills

A. Spatial analysis of physical and cultural processes that shape the human experience

1. Use the tools and concepts of geography appropriately and accurately.

EXAMPLES

a. Identify features of the Earth's physical and cultural regions (e.g., landforms, bodies of water, linguistic patterns, hemispheric divisions).

b. Create a map from textual information to show movement of people and ideas across space and time.

c. Define the concepts of latitude and longitude and how they are used to determine location.

d. Use maps and diagrams to report physical, cultural, and demographic information from a spatial perspective.

2. Analyze the interaction between human communities and the environment.

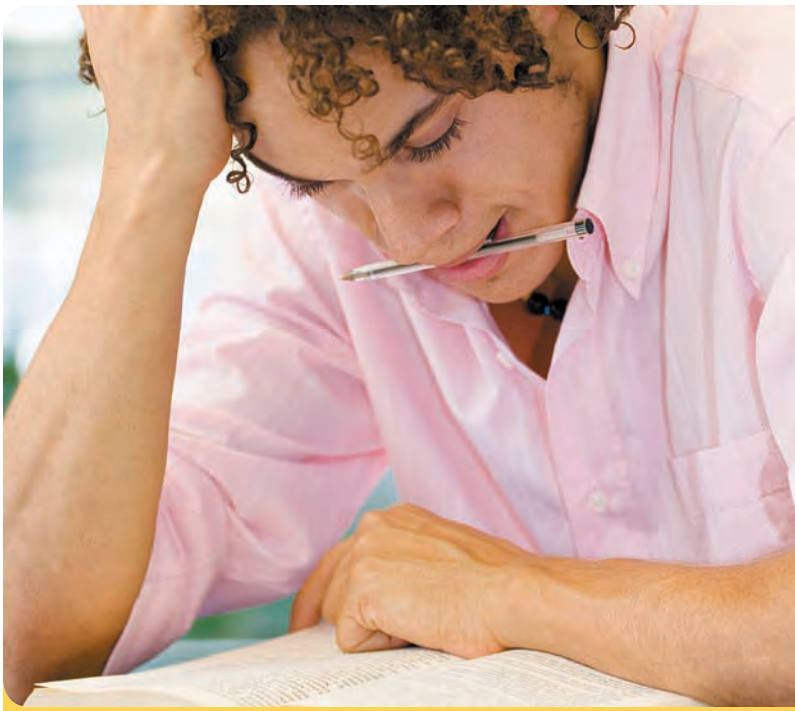
EXAMPLES

a. Compare agricultural and nomadic pastoral societies.

b. Explain the Industrial Revolution and analyze its impact on human societies and the growth of cities.

c. Examine the impact of human migration on culture and the environment.

3. Analyze how physical and cultural processes have shaped human communities over time.



EXAMPLES

a. Explain how climate has influenced human communities over time.

b. Identify barriers to human exchange (e.g., commercial, cultural, biological) in the past, explain efforts by human communities to overcome them, and analyze how these efforts have influenced historical developments.

c. Analyze how human activities (e.g., irrigation, land use policies) have altered the Earth's physical landscape.

4. Evaluate the causes and effects of human migration patterns over time.

EXAMPLES

a. Identify and explain shifts in urban population centers over time and space.

b. Trace the influence of human migration upon domesticated plant and animal distribution over space and time.

c. Explain how technology and economic forces can influence patterns of migration and population distribution.

5. Analyze how various cultural regions have changed over time.

EXAMPLES

a. Explain the impact of borderland regions (such as those of the United States and Mexico) on human interaction and cultural development.

b. Examine how human characteristics and cultural elements (e.g., race, ethnicity, language, religion) distinguish specific regions of the world from each other in the past and present.

6. Analyze the relationship between geography and the development of human communities.

EXAMPLES

a. Explain how desert cultures might develop differently from coastal cultures or others that have ready access to water.

b. Explain how significant physical features and environmental conditions have influenced the cultural, political, and economic characteristics of selected regions in the past and present.

B. Periodization and chronological reasoning

1. Examine how and why historians divide the past into eras.

EXAMPLES

a. Describe the rationale for dividing U.S. history before and after particular dates (e.g., from 1865-1914).

b. Evaluate to what extent World War II can be described as a significant turning point in American history, examining such issues as the expansion of civil rights, the economic influences of the G. I. Bill, and the international role of the United States.

2. Identify and evaluate sources and patterns of change and continuity across time and place.

EXAMPLES

a. Examine how technology has affected culture and community (e.g., the impact of the automobile on the characteristics of cities such as Los Angeles and Houston).

b. Analyze the impact of immigration on the United States at different times in its history.

3. Analyze causes and effects of major political, economic, and social changes in U.S. and world history.

EXAMPLES

a. Examine the sources of the American Revolution and delineate the cultural and political forces that gave rise to the Declaration of Independence and the Constitution.

b. Examine how technology and ideas have been diffused from one region to another along historic trade routes and analyze their impact.

c. Examine how the discovery of oil in such countries as Saudi Arabia and Venezuela has effected economic, political, and cultural change.

C. Change and continuity of political ideologies, constitutions, and political behavior

1. Evaluate different governmental systems and functions.

EXAMPLES

a. Explain the key concepts of democracy expressed in the Declaration of Independence and how they shaped the government and culture of the United States.

b. Compare the Articles of Confederation and the U. S. Constitution and the different views of governance they represent.

c. Distinguish between different systems of government such as fascism, socialism, and Communism, and give examples of each.

d. Explain differences between the governmental system of the United States and other countries (e.g., Canada, the United Kingdom, China).

2. Evaluate changes in the functions and structures of government across time.

EXAMPLES

a. Explain how major historical events such as wars and social and political movements have affected the functions and structure of governments.

b. Analyze how economic and technological developments have changed the function and structure of governments.

c. Delineate and explain several changes to the U.S. Constitution in response to political and social movements.

d. Examine the effects of U.S. court decisions on the Civil Rights Movement over the last 150 years.

e. Analyze the formation and role of key political parties in U.S. history.

f. Consider to what extent political events influence Supreme Court appointments and decisions.

3. Explain and analyze the importance of civic engagement.

EXAMPLES

a. Identify three extraordinary examples of civic responsibility in American history and evaluate their impact on American culture.

b. Explain why high levels of civic participation are essential in democratic societies.

c. Examine the emergence and impact of civil disobedience in different societies and different historical moments.

D. Change and continuity of economic systems and processes

1. Identify and evaluate the strengths and weaknesses of different economic systems.

EXAMPLES

a. Examine the role of the free enterprise system in the U.S. economy and its general impact on American culture.

b. Compare and contrast a traditional, command, and market economy and give examples of the strengths and weaknesses of each.

c. Explain the influence of mercantilism on European colonization practices and analyze its influence on the development of the American colonies.

d. Identify and evaluate examples of government intervention in the marketplace intended to address market failure.

e. Describe how the New York Stock Exchange works and the central role it plays in the U.S. economy.

2. Analyze the basic functions and structures of international economics.

EXAMPLES

a. Explain how changes in a country's economic situation affect its foreign exchange rate and its trade relationships with other countries.

b. Analyze the impact of free trade between countries, examining not only economic effects but cultural and political ones as well.

c. Explain the functions of international economic organizations such as the World Bank, the International Monetary Fund, and the World Trade Organization.

E. Change and continuity of social groups, civic organizations, institutions, and their interaction

1. Identify different social groups (e.g., clubs, religious organizations) and examine how they form and how and why they sustain themselves.

EXAMPLE

a. Identify at least three social groups or civic organizations in your community and analyze the role they play in shaping social relations, public values, and personal identity.

2. Define the concept of socialization and analyze the role socialization plays in human development and behavior.

EXAMPLES

a. Identify the major agents of socialization and how they influence individual identity.

b. Analyze how popular culture (e.g., film, television, music) shape public attitudes.

3. Analyze how social institutions (e.g., marriage, family, churches, schools) function and meet the needs of society.

EXAMPLES

a. Analyze how American universities have played a central role in the formation of American culture and character.

b. Compare and contrast the present-day functions of religious institutions in the United States with those in other parts of the world.

c. Compare and contrast the role of the family in different cultures.

4. Identify and evaluate the sources and consequences of social conflict.

EXAMPLES

a. Identify and analyze how different religious values have led to social conflict in different regions of the world.

b. Explain how modern governments have attempted to reduce social conflict and evaluate the effectiveness of these efforts.

F. Problem-solving and decision-making skills

1. Use a variety of research and analytical tools to explore questions or issues thoroughly and fairly.

EXAMPLES

a. Design a research project that analyzes various points of view on a current controversial issue, such as global climate change.

b. Use both primary and secondary sources to develop a group presentation that analyzes the causes of the U.S. Civil War from the perspectives of residents of both the North and the South.

c. Use both primary and secondary sources to analyze the actions of Abraham Lincoln to end the Civil War and restore national unity.

d. Collect and present visual images (e.g., photographs, paintings, illustrations) that trace shifting attitudes toward women in American culture and analyze changes.

e. Use maps and graphs to compare levels of economic development and standards of living in various countries and suggest reasons for any disparities.

2. Analyze ethical issues in historical, cultural, and social contexts.

EXAMPLES

a. Examine changes over time in American ethical conventions regarding the expression of views on race, ethnicity, and gender.

b. Identify and evaluate ethical guidelines in professional circumstances such as the practice of law and medical research.

c. Evaluate how science and technology have raised concerns about ethical issues, such as the right of privacy.

d. Identify either a national organization or an institution that seeks to promote ethical behavior, and analyze its success and impact.

II. Diverse Human Perspectives and Experiences

A. Multicultural societies

1. Define a "multicultural society" and consider both the positive and negative qualities of multiculturalism.

EXAMPLES

a. Consider whether the United States is a multicultural society and whether multiculturalism is compatible with the principle, "One nation under God."

b. Compare the experience of American multiculturalism with that of other countries with long experiences of immigration.

c. Analyze the sources of violent cultural conflict in several countries and assess whether these cultural differences can be resolved peacefully.

2. Evaluate the experiences and contributions of diverse groups to multicultural societies.

EXAMPLES

a. Describe the contributions of various immigrant groups to the culture of the United States.

b. Trace the growth of minority religious populations in various regions of the world and examine their impact.

B. Factors that influence personal and group identities (e.g., race, ethnicity, gender, nationality, institutional affiliations, socioeconomic status)

1. Explain and evaluate the concepts of race, ethnicity, and nationalism.

EXAMPLES

a. Explain how the concepts of race and ethnicity have evolved in the United States and consider where we stand in regard to becoming a "color-blind" and "hyphenless" nation.

b. Evaluate the concepts of "assimilation" and "acculturation" and determine the impact of each on efforts to preserve American identity.

c. Explain how national identity is distinct from both racial and ethnic identities and consider whether it is possible to hold multiple identities simultaneously.

d. Analyze how national identities are likely to be affected by globalization.

2. Explain and evaluate the concept of gender.

EXAMPLES

a. Trace changes in notions of gender in U.S. history and explain how those changes have led to the expansion of women's roles.

b. Compare and contrast economic opportunities for women in various regions of the world.

3. Analyze diverse religious concepts, structures, and institutions around the world.

EXAMPLES

a. Explain similarities and differences between Judaism, Christianity, and Islam.

b. Use maps to show how religions have diffused across time and space.

c. Describe the roles that different religious groups played in the founding of the United States.

4. Evaluate how major philosophical and intellectual concepts influence human behavior or identity.

EXAMPLES

a. Trace the origins of philosophical concepts such as freedom of religion, inalienable rights, and the pursuit of happiness, and analyze their influence in the founding of the United States.

b. Identify and explain the founding philosophical concepts of various countries and societies.

c. Evaluate the influence of the Protestant Ethic on various countries, including the United States.

5. Explain the concepts of socioeconomic status and stratification.

EXAMPLES

a. Define the concept of class and consider its relationship to race and ethnicity in American history.

b. Describe the impact of poverty on various measures of economic and social success (e.g., education, social mobility, access to health care).

c. Define the concept of caste and analyze its legacy in various societies.

6. Analyze how individual and group identities are established and change over time.

EXAMPLES

a. Explain how certain religious, political, and philosophical traditions have shaped American identity over time.

b. Create a visual presentation that demonstrates the changing depiction by the media of social identities.

c. Analyze how various court decisions or governmental initiatives have shaped individual or group identities over time.

III. Interdependence of Global Communities

A. Spatial understanding of global, regional, national, and local communities

1. Distinguish spatial patterns of human communities that exist between or within contemporary political boundaries.

EXAMPLES

a. Create a map that identifies areas and regions around the world where major world religions have a significant following.

b. Create a map that demonstrates the linguistic diversity of multilingual countries.

2. Connect regional or local developments to global ones.

EXAMPLES

a. List and explain the significance of various technologies developed in a specific location that ultimately shaped world history.

b. Analyze how international events can influence regional or local politics and popular culture.

c. Create a visual presentation to reflect either a regional or local area's global economic connections (e.g., worldwide distribution of local products).

d. Analyze how decisions made by multinational institutions (e.g., OPEC, the International Monetary Fund, the United Nations) affect regional or local circumstances around the world.

3. Analyze how and why diverse communities interact and become dependent on each other.

EXAMPLES

a. Analyze how contact between formerly separate regions has altered societies and their world views.

b. Analyze the causes and long-term impact of immigration from a given region to a given country.

B. Global analysis

1. Apply social science methodologies to compare societies and cultures.

EXAMPLES

a. Compare and contrast the governing policies of the British and Spanish empires over time, explaining how each sought to sustain order and stability.

b. Compare and contrast the historic use of forced labor in various societies.

c. Examine the roots and consequences of decolonization in Africa over the last 100 years.

d. Examine world population trends and recommend ways to reduce infant mortality rates in poor countries.

e. Use a variety of sources and methods to hypothesize the possible economic, political, and cultural impact of globalization on multiple regions of the world over the next 50 years.

IV. Analysis, Synthesis, and Evaluation of Information

A. Critical examination of texts, images, and other sources of information

1. Identify and analyze the main idea(s) and point(s) of view in sources.

EXAMPLES

a. Read an editorial or opinion column from a major newspaper, periodical, or Internet blog, identify the author's main idea(s) and point(s) of view, and evaluate the credibility of evidence used.

b. Evaluate the message and the techniques used to influence public opinion in a variety of media (e.g., film, television, Internet, editorial cartoons).

2. Situate an informational source in its appropriate contexts (contemporary, historical, cultural).

EXAMPLES

a. Analyze a film's presentation of a historical event and the factors influencing this interpretation.

b. Analyze a novel's presentation of a historical event and the factors influencing this interpretation.

c. Examine the coverage of an important event in several major newspapers (e.g., *The New York Times*, *The Washington Post, The Wall Street Journal*) and analyze differences in perspective.

3. Evaluate sources from multiple perspectives.

EXAMPLES

a. Examine the U. S. Constitution as a living document and why it has been subject to different interpretations.

b. Analyze the Equal Rights Amendment and explain why it generated controversy in the United States.

c. Examine the founding of the United Nations and use sources from different countries to prepare a presentation on its effectiveness at accomplishing its original mission.

4. Understand the differences between a primary and secondary source and use each appropriately to conduct research and construct arguments.

EXAMPLES

a. Identify and collect credible and high quality primary and secondary sources that are germane to a given topic.

b. Create an argument (e.g., an essay, letter to the editor, verbal presentation) that uses relevant primary sources.

5. Read narrative texts critically.

EXAMPLES

a. Preview book-length texts by reading introductory material and examining organizational strategies and sources to determine key questions and issues explored.

b. Write a review of a social science text that evaluates the main arguments and the quality of supporting evidence. Conclude with any questions and points of clarification needed to understand the argument.

6. Read research data critically.

EXAMPLES

a. Analyze the results of a public opinion poll noting the size of the polling sample, the margin of error, the manner in which questions were constructed, and the respondent categories.

b. Examine data in any research document carefully to ensure that collected data were gathered in conformity with high standards of research, and that borrowed data came from respected sources, such as the U.S. Census Bureau.

B. Research and methods

1. Use established research methodologies.

EXAMPLES

a. Propose or present theories only when they are supported by extensive credible research and when other possible theories have been eliminated by the evidence.

b. Understand the concept of independent and dependent variables and apply it correctly in developing hypotheses regarding social phenomena (e.g., crime, divorce rates, rates of population growth).

2. Explain how historians and other social scientists develop new and competing views of past phenomena.

EXAMPLES

a. Compare and contrast two works of history that disagree over the causes of the Cold War rivalry between the United States and the Soviet Union, and explain how the authors came to different conclusions.

b. Demonstrate, using specific examples, how historians or other social scientists can come to different perceptions and conclusions about historical events, such as the Great Depression, by using different types of sources and data.

c. Analyze a specific event based on the works of various social scientists and develop an essay that demonstrates points of contention and agreement among these scholars.

3. Gather, organize, and display the results of data and research.

EXAMPLES

a. Display relative quantitative or cartographic information when presenting research analysis in appropriate fashion, such as databases, spreadsheets, GIS, image analysis tools, or graphs.

b. Create, administer, and report on a survey of fellow classmates' positions on an issue.

c. Examine the voting data for particular elections and analyze aspects of voter activity.

4. Identify and collect sources.

EXAMPLES

a. Collect credible primary and secondary sources that provide various points of view on a selected topic.

b. Use a library database to identify key academic journals relevant to the research question at hand.

c. Create an annotated bibliography on a specific topic.

C. Critical listening

1. Understand and interpret presentations (e.g., speeches, lectures, informal presentations) critically.

EXAMPLES

a. Analyze a speech of historical importance (such as Lincoln's Gettysburg Address, Ronald Reagan's 1987 Brandenburg Gate speech, or Martin Luther King, Jr.'s "I Have a Dream" speech) and summarize its main points.

b. Listen to a lecture and write down questions that require clarification, either by consulting the lecturer or other students.

c. Listen to a lecture and connect the new information with previously studied topics.

D. Reaching conclusions

1. Construct a thesis that is supported by evidence.

EXAMPLES

a. Develop a thesis statement, outline, and organizational strategy that will be used to support the thesis in a written paper.

b. Utilize the conventions of the discipline and a variety of sources to write a research paper on a topic germane to a given course.

2. Recognize and evaluate counter arguments.

EXAMPLES

a. Write a short paper advocating a specific cause or action on an important national issue, such as federal immigration policy. Acknowledge counterarguments and explain why your position is preferable to the counterargument(s). Cite evidence that strengthens your argument.

b. Identify and summarize relevant primary or secondary sources that pose contradictory arguments on an issue.

V. Effective Communication

A. Clear and coherent oral and written communication

1. Use appropriate oral communication techniques depending on the context or nature of the interaction.

EXAMPLES

a. Debate the pros and cons of a research question.

b. Prepare for and actively participate in a class discussion on a historical conflict.

2. Use conventions of Standard Written English.

EXAMPLES

a. Utilize standard written English in formal writing assignments and proof-read to correct grammar, spelling, and punctuation errors.

b. Share drafts of writing assignments with teachers, parents, or other students, and then revise as appropriate.

B. Academic integrity

1. Attribute ideas and information to source materials and authors.

EXAMPLES

a. Identify ethical issues and consequences surrounding plagiarism.

b. Demonstrate knowledge of copyright and fair use laws by adherence to these laws in all assignments.

c. Reference research material using appropriate citation/referencing styles (e.g., *The Modern Language Handbook for Writers of Research Papers*, *The University of Chicago Manual of Style*).

d. Write an essay that includes citations of both paraphrased material and directly quoted material.

e. Identify the code of conduct involving academic honesty at your school, a local college, or university, and list several examples of what constitutes a violation of this code and the punishment for violating it.

f. Explain why an academic integrity standard is necessary and the consequences of violating it.

Cross-Disciplinary Standards

with performance indicators

I. Key Cognitive Skills

A. Intellectual curiosity

1. Engage in scholarly inquiry and dialogue.

EXAMPLES

a. Identify what is known, not known, and what one wants to know in a problem.

b. Conduct investigations and observations.

c. Cite examples or illustrations in which a clear-cut answer cannot be reached.

2. Accept constructive criticism and revise personal views when valid evidence warrants.

EXAMPLES

a. Articulate a point of view and provide valid evidence to support findings.

b. Demonstrate willingness to take intellectual risks by investigating novel, controversial, or unpopular opinions or conclusions.

c. Examine alternative points of view, taking different roles to defend, oppose, and remain neutral on issues.

d. Recognize conflicting information or unexplained phenomena.

B. Reasoning

1. Consider arguments and conclusions of self and others.

EXAMPLES

a. Know and apply logic to analyze patterns and descriptions and to evaluate conclusions.

b. Cite valid examples or illustrations that support the conclusions.

c. Question whether the claims and conclusions of self and others are supported by evidence.

d. Identify counter examples to disprove a conclusion.

2. Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions.

EXAMPLES

a. Participate in a debate that is based on facts and has a logical structure.

b. Construct a visual presentation, including hypothesis, data, results, and conclusion.

c. Write a paper that addresses counter-arguments to advocated positions.

EXAMPLES

d. Recognize and apply techniques of statistical or probabilistic analysis to judge reliability of information.

e. Organize an argument separating fact from opinion.

3. Gather evidence to support arguments, findings, or lines of reasoning.

EXAMPLES

a. Use different kinds of data (e.g., case studies, statistics, surveys, documents) to support an argument.

b. Evaluate evidence in terms of quality and quantity.

c. Describe limitations of data collection methods.

4. Support or modify claims based on the results of an inquiry.

EXAMPLES

a. Refine claims and adjust a position in response to inquiry.

b. Review and check strategies and calculations, using alternative approaches when possible.

C. Problem solving

1. Analyze a situation to identify a problem to be solved.

EXAMPLES

a. Represent and/or restate the problem in one or more ways (e.g., graph, table, equation), showing recognition of important details and significant parameters.

b. Break complex problems into component parts that can be analyzed and solved separately.

c. Apply previously learned knowledge to new situations.

d. Analyze a media report, identify any misuse of statistics, and suggest ways to more accurately depict this information.

2. Develop and apply multiple strategies to solve a problem.

EXAMPLES

a. Use a range of standard methods, devices, techniques, and strategies to gather and analyze information.

b. Use knowledge gained from other subject areas to solve a given problem.

3. Collect evidence and data systematically and directly relate to solving a problem.

EXAMPLES

a. Use general and specialized reference works and databases to locate sources.

b. Collect evidence and data directly related to solving the problem and eliminate irrelevant information.

c. Produce charts, graphs, and diagrams accurately, including scale, labeling, units, and organization.

d. Present the collected data visually, describe the data collection procedure, and defend choosing that procedure over other possibilities.

D. Academic behaviors

1. Self-monitor learning needs and seek assistance when needed.

EXAMPLES

a. Ask questions to check for understanding or to clarify information.

b. Use a systematic method for recording, storing, and organizing materials and resources; avoid haphazard or messy accumulation of information.

2. Use study habits necessary to manage academic pursuits and requirements.

EXAMPLES

a. Manage time effectively to complete tasks on time.

b. Demonstrate accurate note-taking.

c. Use the appropriate level of detail necessary to complete an assigned task.

d. Balance academic and non-academic activities to successfully participate in both.

3. Strive for accuracy and precision.

EXAMPLES

a. Collect and report experimental data carefully and correctly.

b. Produce charts, graphs, and diagrams accurately, including scale, labeling, units, and organization.

c. Eliminate irrelevant information from an assignment.

4. Persevere to complete and master tasks.

EXAMPLES

a. Persevere until a task is completed by working even when faced with uncertainty or open-ended assignments.

b. Seek assistance when needed to complete the assignment.

c. Recognize when a task is completed.

E. Work habits

1. Work independently.

EXAMPLES

a. Plan a project, establish its parameters, and complete it with minimal supervision, seeking assistance accordingly.

b. Follow directions or procedures independently.

c. Complete assignments outside the classroom setting in a timely manner.

2. Work collaboratively.

EXAMPLES

a. Work collaboratively with students from various cultural and ethnic backgrounds.

b. Distinguish between situations where collaborative work is appropriate and where it is not.

c. Work in small groups to investigate a problem or conduct an experiment.

F. Academic integrity

1. Attribute ideas and information to source materials and people.

EXAMPLES

a. Document the work of others, giving credit where credit is due and never claim credit for work that is not one's own.

b. Use standard bibliographic and reference citation formats, choosing the style appropriate to the subject and the audience.

c. Define plagiarism and articulate the consequences of academic dishonesty.

2. Evaluate sources for quality of content, validity, credibility, and relevance.

EXAMPLES

a. Verify validity of a source within a submitted work.

b. Compare and contrast coverage of a single topic from multiple media sources.

3. Include the ideas of others and the complexities of the debate, issue, or problem.

EXAMPLES

a. Present multiple perspectives of an issue.

b. Represent accurately the data, conclusions, or opinions of others.

4. Understand and adhere to ethical codes of conduct.

EXAMPLES

a. Follow copyright laws and restrictions.

b. Use technology responsibly (e.g., avoiding malice, misrepresentation, or misleading use of information).

II. Foundational Skills

A. Reading across the curriculum

1. Use effective prereading strategies.

EXAMPLES

a. Use the title, knowledge of the author, and place of publication to make predictions about a text.

b. Use a table of contents to preview a text and understand its design.

c. Scan headline sections or other division markers, graphics, or sidebars to form an overview of a text.

2. Use a variety of strategies to understand the meanings of new words.

EXAMPLES

a. Use context clues, including definitions, examples, comparison, contrast, cause and effect, and details provided in surrounding text.

b. Consult references (e.g., dictionary, thesaurus) effectively.

c. Understand notation specific to discipline (e.g., mathematical notation, scientific symbols).

3. Identify the intended purpose and audience of the text.

EXAMPLES

a. Predict purpose and audience of a text based on the title, preface, and other features of a text.

b. Explain how the language of an effective text targets an intended audience.

c. Explain the importance of a technical and/or scientific article.

4. Identify the key information and supporting details.

EXAMPLES

a. Outline a chapter of an informational text.

b. Summarize the major points in a text, and use graphic organizers (e.g., concept maps, diagrams) to organize ideas and concepts in a visual manner.

c. Analyze connections between major and minor ideas.

d. Identify and define key terminology from technical and/or scientific documents.

5. Analyze textual information critically.

EXAMPLES

a. Identify faulty premises in an argument.

b. Identify stated and implied assumptions.

c. Identify conclusions unsupported by sufficient evidence in informational texts.

d. Use inductive and deductive reasoning.

e. Draw conclusions based on evidence, support, or data through logical reasoning.

f. Compare a primary source and an interpretation in a textbook.

6. Annotate, summarize, paraphrase, and outline texts when appropriate.

EXAMPLES

a. Outline an informational or literary text.

b. Annotate text for comprehension and analysis.

c. Summarize an article to demonstrate comprehension.

d. Paraphrase a writer's ideas or findings.

7. Adapt reading strategies according to structure of texts.

EXAMPLES

a. Identify a variety of textual forms and genres (e.g., long and short texts) and adapt reading strategies accordingly.

b. List strategies to use during reading, including:

- Anticipate and predict what information the text is likely to contain.
- Monitor understanding by self-questioning.
- Use strategies (e.g., mental imagery, paraphrasing, information in glossaries) to re-examine the text if comprehension fails.
- Reread difficult passages.
- Read ahead for additional clarification.
- Seek assistance for clarification.
- Self-monitor and summarize the information gained.

c. Explain how form or genre communicates meaning.

8. Connect reading to historical and current events and personal interest.

EXAMPLE

a. Locate an article or source that relates to a class topic and explain the relevance.

B. Writing across the curriculum

1. Write clearly and coherently using standard writing conventions.

EXAMPLES

a. Prepare a topic proposal that specifies a purpose and justifies the choice of audience to achieve that purpose.

b. Craft a thesis statement that articulates a position and list relevant evidence and examples in logical groupings.

c. Use symbols, diagrams, graphs, and words to communicate ideas.

d. Use appropriate terminology and data expression to communicate information in a concise manner.

e. Use a variety of reference guides for citation conventions, grammar, mechanics, and punctuation.

2. Write in a variety of forms for various audiences and purposes.

EXAMPLES

a. Present an argument supported by relevant evidence, examples, and counterarguments.
b. Prepare a summary or abstract of a journal article or report, extracting in brief form the pertinent information.
c. Evaluate articles by analyzing the study design, data source, graphical representation of data, and analyzed data results reported (or not reported).
d. Write a reflection about the process selected to conduct research or solve a problem.
e. Write accurate and understandable lab reports and technical documents.

3. Compose and revise drafts.

EXAMPLES

a. Submit a writing assignment to be proofread by a teacher, parent, or other student. Revise the paper, incorporating constructive criticism when appropriate.
b. Edit text for correct spelling, capitalization, and punctuation.
c. Edit for appropriate tense and voice.
d. Edit for correct word use.
e. Use a variety of reference guides for citation conventions, grammar, mechanics, and punctuation.
f. Submit a final draft that is easily read and has few or no grammatical or spelling errors.

C. Research across the curriculum

1. Understand which topics or questions are to be investigated.

EXAMPLES

a. Formulate research questions.
b. Use strategies like those in the writing process to generate questions and areas to pursue.
c. Consult previous studies or conduct interviews with experts to identify questions central to a research topic.
d. Propose explicit, testable hypotheses, using the "if ..., then ..." format.

2. Explore a research topic.

EXAMPLES

a. Produce an annotated list of sources consulted, differentiating among primary, secondary, and other sources and explain their relevance to the research topic.
b. Outline the most significant controversies or questions on a research topic.
c. Plan an investigative study.
d. Explain reasons for valid competing points of view on a given topic.

3. Refine research topic based on preliminary research and devise a timeline for completing work.

EXAMPLES

a. Gather information from a variety of relevant sources.
b. Use general and specialized reference works and databases to locate sources.
c. Locate electronic sources, when appropriate, using advanced search strategies.
d. Select an appropriate range of source materials.
e. Analyze a wide range of sources, including technical texts, primary and secondary sources, conflicting points of view, and interdisciplinary research when appropriate.
f. Design and carry out hands-on experimental investigations, choosing appropriate apparatuses, identifying controls and variables, tentatively predicting the outcome of the procedures, and evaluating whether actual results agree with predicted results.
g. Use numerical and mathematical tools such as software, including databases, spreadsheets, and other tools, in investigations and explanations.

4. Evaluate the validity and reliability of sources.

EXAMPLES

a. State explicitly characteristics or identifying features that indicate accuracy or reliability of sources, to determine whether sources are biased, incomplete, or otherwise unreliable.

b. Follow a set of criteria to determine the validity and reliability of sources.

c. Identify claims found in one or more of the sources that require support or verification, and evaluate the information's validity.

d. Evaluate the data presented in graphics, tables, charts, and maps when appropriate to the topic.

5. Synthesize and organize information effectively.

EXAMPLES

a. Select quotations and evidence that support the thesis.

b. Determine what evidence best supports conclusions.

c. Use well-organized strategies to collect and organize information gathered.

d. Determine the best order for presenting evidence that supports conclusions.

6. Design and present an effective product.

EXAMPLES

a. Determine the best order for presenting major and minor points.

b. Design a report using features such as headings and graphics appropriate to the writing task.

c. Use a citation system specified by or appropriate to the assignment.

7. Integrate source material.

EXAMPLES

a. Integrate source material into text by a combination of accurately summarizing, paraphrasing, and quoting.

b. Balance use of source material with relevant explanations.

c. Use source material ethically.

d. Understand and avoid all types of plagiarism.

8. Present final product.

EXAMPLES

a. Use appropriate media for presentation of research results.

b. Document sources using a standard format appropriate to the subject area.

D. Use of data

1. Identify patterns or departures from patterns among data.

EXAMPLES

a. Identify patterns from multiple representations of data such as graphical and tabular forms.

b. Review current news events and evaluate possible connections (e.g., linking economic data with political events).

2. Use statistical and probabilistic skills necessary for planning an investigation and collecting, analyzing, and interpreting data.

EXAMPLES

a. Create representations of data (e.g., data tables, correctly labeled and scaled graphs, narrative descriptions).

b. Evaluate a given published report for missing information and misuse of data.

3. Present analyzed data and communicate findings in a variety of formats.

EXAMPLES

a. Compose a written document detailing a research project.

b. Use appropriate visuals and statistical results to convey findings to a specified audience.

E. Technology

1. Use technology to gather information.

EXAMPLES

a. Use the Internet or other appropriate technologies to post survey questions on an assigned topic.

b. Use devices to measure physical properties.

c. Use online databases to access scholarly work on an assigned research topic.

2. Use technology to organize, manage, and analyze information.

EXAMPLES

a. Use data analysis software to analyze survey results.

b. Use spreadsheets to manage and organize statistical data.

3. Use technology to communicate and display findings in a clear and coherent manner.

EXAMPLES

a. Create spreadsheets and graphs to communicate findings in a presentation that includes graphics, visuals, or other supporting images.

b. Utilize technology to present information and/or data in a variety of ways.

4. Use technology appropriately.

EXAMPLES

a. Explain how technology is a useful and effective tool to communicate findings.

b. Identify when technology may not be necessary or appropriate to communicate findings.

c. Formulate strategies to communicate findings with and without technology.

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Attachment 4g

Comparison Of Texas CCRS and Common Core Standards

Lining Up: The Relationship between the Common Core State Standards and Five Sets of Comparison Standards

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epic

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The Authors

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Executive Summary

In June 2010, the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO) released the Common Core State Standards.[1] The stated aim of the Common Core standards is to define the knowledge and skills students should achieve in order to graduate from high school ready to succeed in a wide range of postsecondary educational settings (Common Core State Standards Initiative, 2010a).

As of October 2011, 44 states and the District of Columbia had officially adopted the standards. This widespread potential implementation of the Common Core standards has led to interest by states and national organizations regarding the relationship between these new standards and existing systems of standards. Are the Common Core standards aligned with the standards states and others have developed over many years? Are they as challenging? Do they cover the same topic areas with the same emphases?

To help answer these questions, the Educational Policy Improvement Center (EPIC), designed and conducted this study to determine the extent of correspondence (alignment) between the exit level Common Core standards and each of five sets of existing standards. The sets of standards were selected because they were either identified as exemplary state standards, were explicitly written at the college readiness level, or represented a rigorous instructional program focused on college readiness. The purpose was to see if the Common Core standards cover similar content, how broadly they cover the comparison standards, and how the cognitive challenge level of aligned content matches up.

The study asks three questions about the Common Core standards in English language arts and literacy, and mathematics:

Alignment

The Educational Policy Improvement Center designed and conducted this study to determine the extent of correspondence (alignment) between the exit level Common Core State Standards and each of five sets of existing standards. The sets of standards were selected because they were either identified as exemplary state standards, were explicitly written at the college readiness level, or represented a rigorous instructional program focused on college readiness.

[1]Referred to hereafter as the Common Core standards.

1. To what extent are the knowledge and skills found in the comparison standards the same as or different from what is described in the Common Core standards? (match)
2. What is the cognitive complexity level of the Common Core standards and to what extent are the matched comparison standards at a higher or lower level of cognitive complexity? (depth)
3. How broadly do the matched comparison standards cover the content of the Common Core standards? (breadth)

Study Overview

Comparison Standards

The comparison standards selected for the study come from two states that have been regarded as having high quality educational standards: California and Massachusetts (Achieve, Inc., 2010). The Texas College and Career Readiness Standards are included because they represent one of the only sets of competencies and skill statements developed by a postsecondary education agency in collaboration with K-12 educators (Texas Higher Education Coordinating Board & Texas Education Agency, 2008). The other set of college readiness standards, the Knowledge and Skills for University Success (KSUS), were developed by university faculty in the early 2000s and represent the first set of such standards (Conley, 2003). Finally, to capture a more international perspective, the standards from the International Baccalaureate (IB) Diploma Programme are also examined. The IB Diploma Programme is offered in 141 countries and is becoming increasingly popular in the US.

The specific comparison standards are as follows:

- California: The Content Standards for California Public Schools, for the 11th–12th grade band in English language arts and for 8th–12th grade band in mathematics (released in 1997)
- Massachusetts: The Massachusetts Curriculum Frameworks, for the 11th–12th grade band in English language arts (released in 2001) and mathematics (released in 2000)
- Texas: The Texas College and Career Readiness Standards in English/language arts, mathematics, and cross-disciplinary standards (released in 2008)
- KSUS: The Knowledge and Skills for University Success (KSUS) standards in English and mathematics,[2] developed as college-preparatory standards by Standards for Success (released in 2003)
- IB: The International Baccalaureate Diploma Programme English language arts and mathematics standards, developed by EPIC, for IB's Programs of Study for 10th–12th grades[3] (released in 2009)

Methodology

We adopted and adapted Cook and Wilmes's (2007) standards-to-standards alignment methodology that includes a combination of linking (match between standards) and correspondence (depth and breadth). The method derives from Webb's alignment methodology (1997, 1999, 2002a). The Cook and Webb approaches have been widely used to assess alignment of assessments and standards. The method employs panels of experts to review and rate content and cognitive processes for each standard and then use the expert ratings to calculate statistics of alignment. These statistics demonstrate how closely the assessment reflects the standards in terms of content and cognitive challenge (Webb, Herman, & Webb, 2007). Standards-to-standards alignment (Cook, 2007; Cook & Wilmes, 2007) provides a means to quantify and evaluate the extent of overlap between different sets of standards in terms of knowledge, skills, and content.

Three alignment indices provide the data to answer the study's three research questions:

1. **Categorical Concurrence:** the extent of overlap or match between the comparison standards and the Common Core standards.

[2]These did not include the Knowledge and Skills Foundations within the English and mathematics sections.
[3]Note that the study did not include any content from IB "options." These are additional required components, which each IB school selects. The number of options varies by course and by subject. The IB options do not have specific standards.

2. **Depth of Knowledge Consistency:** a comparison of cognitive demand of matched content between the sets of comparison standards and the Common Core standards.

3. **Breadth of Coverage:** how broadly matched comparison standards cover content elements of the Common Core standards.

Nine English language arts experts and seven mathematics experts comprising secondary and post-secondary educators completed two tasks. Each rated the Depth of Knowledge of each standard and then determined the degree to which each comparison standard matched content in the Common Core standards. When determining match, they identified up to three Common Core standards that corresponded with a standard in a comparison set. The limit of three standards follows the Webb protocol and philosophy that alignment should concentrate only on content central to the statements.

Findings

The overall results of the study suggest substantial concurrence between the Common Core standards and the comparison standards, with somewhat greater alignment in mathematics than in ELA and literacy. For ELA and literacy, 36 of 40 analyses at the strand level meet the Categorical Concurrence criterion. For mathematics, all 25 analyses at the conceptual category level meet the Categorical Concurrence criterion.

The findings suggest general consistency between the cognitive challenge level of the Common Core standards and the five comparison standard sets. Mathematics shows somewhat more consistency of cognitive challenge than do the ELA and literacy standards. In ELA and literacy, 17 of 36 strand-level analyses indicate that the comparison standard sets are at or above the level of the Common Core standards. For mathematics, 19 of 25 conceptual category-level analyses indicate that the comparison standard sets are at or above the level of the Common Core standards. Overall, the standards from the comparison sets tend to cover the breadth of topics contained in the Common Core standards. For ELA and literacy, 37 of 40 strand analyses show strong coverage. For mathematics, findings suggest that comparison sets show strong coverage of all 25 conceptual category analyses. While every standard in the Common Core standards may not have a match with each and every set of comparison standards, the topics around which the Common Core standards are organized are reflected in the comparison standards with a high degree of frequency.

Conclusion

The business of analyzing alignment, cognitive challenge, and coverage between sets of standards remains an approximate art, even when ample care is given to controlling variation and ensuring reliable and valid results. This is one of the reasons we offer findings at a high level of aggregation. Educators should bear in mind the overall goals of the Common Core standards when considering the mechanics of alignment. Those goals are to raise the challenge level for U.S. students, to enable all students to pursue successful futures beyond high school, and to equip students with a set of core knowledge and skills that enable them to be adaptive learners throughout their lives.

Alignment is a preliminary and first step to achieving the goal of standards implementation. This study offers initial findings regarding five sets of comparison standards that are considered rigorous and good indicators of college and career readiness. While additional analyses at the individual state level are needed, the overall findings from this study suggest a general level of agreement between the Common Core standards and the comparison standards regarding what is important for high school students to know and be able to do and the cognitive level at which they need to demonstrate key skills in English language arts and mathematics in order to be ready for college and careers.

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Chapter 1 | Introduction

States are concerned about the rigor of the Common Core State Standards and the relationship between this new system of standards and existing standards, particularly at the exit level from high school. The Educational Policy Improvement Center (EPIC), therefore, designed and conducted the current study to determine the extent of correspondence (alignment) between the exit level Common Core State Standards and each of five sets of existing standards. The sets of standards were selected because they were either identified as exemplary state standards, were explicitly written at the college readiness level, or represented a rigorous instructional program focused on college readiness. The purpose was to see if the Common Core State Standards covered similar content; if so, how broadly they covered the comparison standards; and whether the cognitive challenge level of aligned content was comparable.

The study addressed three research questions for each of the two subject areas for which Common Core State Standards have been developed – namely, English language arts and literacy, and mathematics. These three questions provide information on whether the five sets of comparison standards reflect similar requirements as the Common Core State Standards (called Common Core standards throughout the rest of this report).

The research questions are as follows:

1. To what extent are the knowledge and skills found in the comparison standards the same as or different from what is described in the Common Core standards? (match)
2. What is the cognitive complexity level of the Common Core standards and to what extent are the matched comparison standards at a higher or lower level of cognitive complexity? (depth)
3. How broadly do the matched comparison standards cover the content of the Common Core standards? (breadth)

The comparison standards included sets of standards from two states that have been regarded as leaders in educational standards: California and Massachusetts (Achieve, Inc., 2010). The Fordham Foundation awarded the California standards a rare A grade for both English language arts and mathematics in its 2005 and 2010 analyses (Carmichael et al., 2010). For Massachusetts, the Fordham Foundation gave the English language arts state standards A grades in its 2005 and 2010 analyses and gave the mathematics standards a B+ in 2005 and an A in 2010 (Carmichael et al., 2010). Additionally, students from Massachusetts perform among the top states on the National Assessment of Educational Performance (Lee, Grigg, & Dion, 2007; Lee, Grigg & Donahue, 2007; National Center for Education Statistics, 2009a, 2009b).

We also compared the Common Core standards to two sets of college and career readiness standards: one from a state, Texas, and another that has been used broadly during the past eight years – the Knowledge and Skills for University Success. The Texas College and Career Readiness Standards are a collection of competencies and skills that secondary students must possess to succeed in postsecondary education. They are intended to complement existing state high school standards, and create a culture of college and career readiness (Texas Education Agency, 2009). Published in 2003, the Knowledge and Skills for University Success (KSUS) standards reflect the contributions of more than 400 faculty and staff from 20 leading research universities. The faculty identified knowledge and skills that students need to succeed in entry-level courses at their institutions. Multiple peer reviews were used to hone the standards and ensure

their validity (Conley, 2003). The KSUS standards have been endorsed by 28 research universities as reflecting expectations at the institutions for students in entry-level courses (Conley & Ward, 2009) and have been used by the College Board as a reference in the development of its assessments and standards (Brown & Conley, 2007).

Finally, we included a set of international standards from the International Baccalaureate (IB) Diploma Programme. Designed to be academically challenging preparation for college work, the IB program comprises six courses taken over the final two years of high school. In its analysis of the IB, the Fordham Foundation gave the IB Language A English Standard Level (SL) course a grade of B+, based on content, rigor, and clarity (Byrd, Ellington, Gross, Jago, & Stern, 2007). Reviewers deemed that the course requires students to be "well grounded in literary genres" (p. 15). They gave the Math Standard Level course a B-, praising, in particular, the free-response exams as "excellent, requiring way beyond the normal high school fare" (p. 16). The courses are known to emphasize the application of student learning so that students transfer their learning from one context to another (Phillips & Wong, 2010). Historically, the IB Diploma Programme has relied on the aims and goals specified in course documents to convey required content. Relatively recently, formal standards were developed (Conley & Ward, 2009). These standards serve as the reference point for this analysis.

In this study, the Common Core standards are the reference point to which the other five sets of standards are compared (and we therefore refer to the other five sets of standards as the comparison standards). Our primary interest was to analyze the Common Core standards, particularly as a companion piece to another EPIC study that explored the extent to which the Common Core standards are reasonable college and career preparatory standards (see Conley, Drummond, de Gonzalez, Rooseboom, & Stout, 2011; www.epiconline.org). We used the Common Core standards as the reference point for matching to existing standards in order to identify consistent patterns of alignment or misalignment across standard sets. (Findings for the individual studies do appear throughout the report and in the appendices; however, the Common Core standards were consistently the reference point.) We did not conduct the reverse analysis: using each set of external standards as a reference for matching to the Common Core. The intent was not to provide individual alignment profiles for a number of standards sets to the Common Core. We understand many states are engaging in this type of analysis, and we did not want to duplicate such efforts.

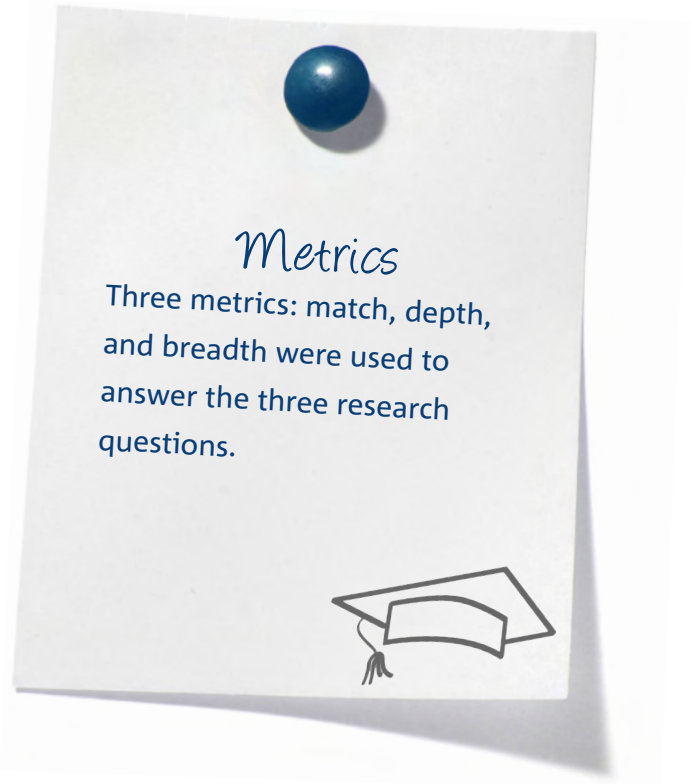
We used Cook and Wilmes's (2007) conception of standards-to-standards alignment – a combination of linking (match between standards) and correspondence (depth and breadth) based on Webb's widely employed test-item-to-standards methodology (1997, 1999, 2002a). We used the Web Alignment Tool (WAT), created by Webb for analysis. Experts rated all the standards sets in terms of their cognitive complexity and then, following Webb's methodology (Webb, 2002b; Roach, Elliot, & Webb, 2005; Cook, 2005), matched up to three standards from Common Core standards to each standard in the comparison standard sets.

This method differs from other standards-to-standards methods in two important ways. First, the method we used limits raters to specifying three matching statements, whereas other methods allow an unlimited number of matches (e.g., Rolfus, Decker, Brite, & Gregory, 2010; Timms, Schneider, Lee, & Rolfus, 2007). Webb originally created this limitation so that reviewers would concentrate on only the central content knowledge expressed in a statement (Webb, 1999). Second, the Webb methodology (and WAT tool) assigns equal importance to every set of matches. Therefore, Webb emphasizes that when making a match, raters should ensure that the comparison statement targets, in full, the reference statement (Webb, Alt, Ely, & Vesperman, 2005). In short, the

methodology does not make use of partial matches the way that other alignment studies do (e.g., Rolfhus, Cook, Brite, & Hartman, 2010). As Rolfhus, Cook, Brite, and Hartman (2010) point out, a weakness of the partial match methodology is that indication of partial matching can mean that the comparison standard matches just one element of a multidimensional reference standard or that it matches all but one of the many elements. Thus, we decided on a less ambiguous and more conservative definition of matching.

We use three metrics: match, depth, and breadth, to answer the three research questions. To answer the first research question, we look at the measure of match, Categorical Concurrence, to determine the extent to which content is consistent across the Common Core standards and each set of comparison standards. To answer the second research question, we first determine the cognitive demand of the Common Core standards and the comparison standards by means of the Depth of Knowledge rating. Then, we compare cognitive demand to gauge where cognitive challenge is higher, lower, or the same using the Depth of Knowledge Consistency statistic for content areas that match with the Common Core standards. We address the third research question using the Breadth of Coverage metric that ascertains the extent to which the comparison standards that match Common Core standards cover a similar scope of content.

In Chapter 2, we describe the methodology and provide an overview of the standards that were used in the study. Chapter 3 presents the results of alignment of the Common Core standards for English language arts and literacy, and Chapter 4 presents results for mathematics. Chapter 5 discusses study findings and implications. Appendix A provides more information about the methodology that was used. Appendix B lists the Common Core standards and summary information about the expert ratings. Appendices C and D provide more detailed information on the findings for each set of comparison standards. Lengthier and more detailed information about each set of comparison standards and precise matches with the Common Core standards is provided under separate cover in the Technical Supplement (https://www.epiconline.org/files/pdf/LiningUpTechnicalSupplement.pdf).



We measured alignment using a modified version of the Webb alignment protocol. The Webb methodology (1997; 1999; 2002a) has been widely used to assess alignment of assessments to standards. The approach relies on using panels of experts to examine content and cognitive processes in assessments and standards and then, based on those experts' ratings, calculating statistics of alignment. These statistics demonstrate how closely the assessment reflects the standards (Webb, Herman, & Webb, 2007). Over time, researchers have used modified versions of the Webb method with different variations of alignment indices (Rothman, 2003; Wixson, Fisk, Dutro, & McDaniel, 2002).

The approach has also been modified to determine standards-to-standards alignment (Cook, 2007; Cook & Wilmes, 2007). Standards-to-standards alignment provides a means to quantify and evaluate the extent of overlap between different sets of standards in terms of knowledge, skills, and content. Alignment methodology also allows for comparison between standards in terms of the cognitive demand of content and in terms of the breadth of overlap. In the current study, alignment includes three indices:

1. **Categorical Concurrence:** the extent of overlap or match between the comparison standards and the Common Core standards.
2. **Depth of Knowledge Consistency:** a comparison of cognitive demand of matched content between the sets of comparison standards and the Common Core standards.
3. **Breadth of Coverage:** how broadly matched comparison standards cover content elements of the Common Core standards.

Below, we discuss the process for collecting the requisite data for alignment and then explain the alignment statistics and data analysis.

Data Collection

We followed the training and data collection processes laid out by Webb et al. (2005).

Raters

Raters were recruited from a pool of experts who had experience with standards alignment. Representation from national educational organizations was also sought; invitations were extended to the International Reading Association and the National Council of Teachers of Mathematics.

A total of 16 raters participated, including nine English language arts (ELA) experts and seven mathematics experts. The raters comprised a mix of secondary and post-secondary educators. Each subject area had a group leader. This individual had more standards alignment experience than other raters in the subject area and helped facilitate the group.

Rater Orientation

Each group leader participated in a web conference orientation session prior to the full group sessions. EPIC researchers explained the overall alignment process and specific leader responsibilities. Then during group sessions, the leaders explained the Depth of Knowledge (DOK) ratings and coding process and guided other raters through alignment examples under the overall supervision of EPIC researchers.

Each group (ELA and mathematics) participated in two web conferences. During the first session, EPIC researchers explained the standards-to-standards alignment process and defined terminology. Under guidance from the group leader, the raters developed an initial understanding of DOK categories (explained below) and engaged in practice ratings. At the end of the first training, each group was given the task of assigning a DOK rating to each Common Core high school mathematics standard or each Common Core standard for ELA and literacy for grades 11–12.

During the second session, raters agreed upon a single DOK rating for each Common Core standard. This was accomplished by presenting all raters' DOK levels for each Common Core standard to the entire group of raters. Standards without a clear majority rating were discussed until consensus was reached. In the second part of the call, raters discussed and completed practice examples of how to determine whether to match comparison standards and Common Core standards. They developed decision rules designed to provide clarity in situations where ambiguity or confusion could arise in the ratings process. As Webb (2002b) points out, although the training process involves calibration, it is not designed for raters to reach exact agreement. Reviewers' responses are averaged, which helps account for differences in coding (Webb, 1999). Additionally,

variance among reviewers reflects valid differences of opinion resulting from lack of clarity in standards statements (Webb, 2002b).

Rating Process

For each of the five sets of comparison standards, raters independently completed two tasks. They rated the DOK of each comparison standard and then determined the degree to which each comparison standard matched content in the Common Core standards. When determining match, they identified up to three Common Core standards that corresponded with a standard in a comparison set. The limit of three standards follows the Webb protocol and philosophy that alignment should concentrate only on content central to the statements. If raters found more than three statements that could match, they used professional judgment to select the three best matches. Raters were not allowed to make partial matches; that is, the comparison standard had to match the full Common Core standard. This meant that a broader comparison standard could be matched to a more narrow Common Core standard, but the reverse could not occur because the content in the Common Core standard would not be fully addressed.

If raters found that every standard within a particular Common Core subarea corresponded with comparison standards, then they rated at the superordinate level. This was the only time that more than three standards could be matched. For ease of reference, we call this level a topic for the Common Core ELA and literacy standards. The Common Core mathematics standards refer to this level as a *cluster*. Rating data were entered into the Web Alignment Tool (WAT) for analysis. Next, we present more specific information about the number of statements that were rated for each set of standards.

Rating of Common Core Standards

English Language Arts and Literacy

The Common Core English language arts (ELA) and literacy standards for grades 11–12 are organized into *strands, anchor standards*, and *standards*. We use the term *strand* to refer to each of the eight groups of related standards. Each strand is based on six to ten statements, called College and Career Readiness (CCR) Anchor Standards. The CCR Anchor Standards aim to describe cross-disciplinary literacy expectations that should be met in order for students to be prepared for success in college and workforce training programs (Common Core State Standards Initiative, 2010b). For each strand, the CCR standards present broad concepts that are applied to all grade levels. Specific standards then spell out how the CCR Anchor Standards are approached for different grade bands.[1] For this study, we used the Common Core ELA and literacy standards for the highest grade band: grades 11–12. Table 1 summarizes the organization of the Common Core ELA and literacy standards for high school.

Each of the strands contains two to four organizing categories,

[1]In some cases the high school grade-specific standard is identical to the College and Career Readiness anchor standard.

Table 1. Organization of the Common Core English Language Arts and Literacy Standards

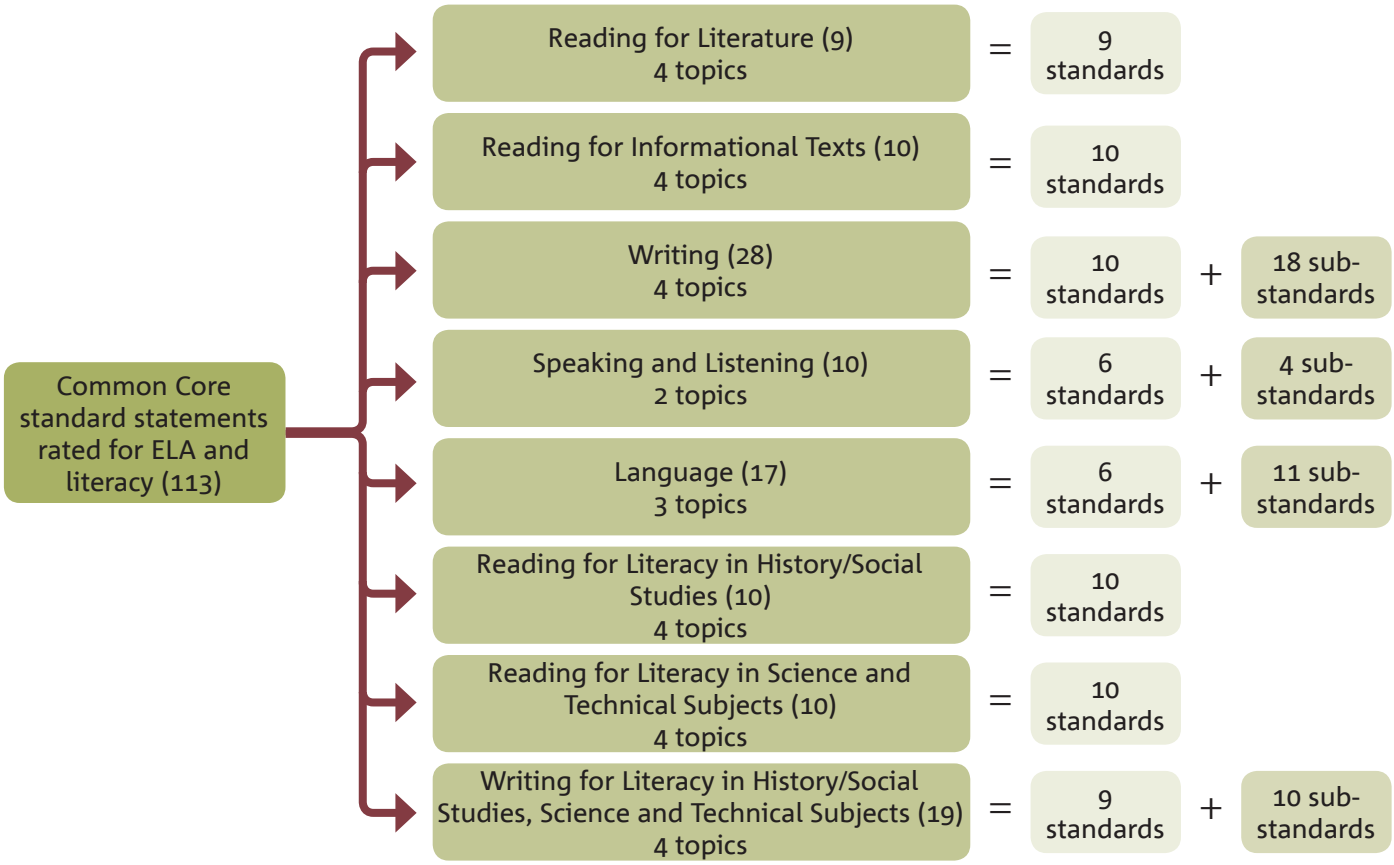
Standards for English Language Arts	Standards for Literacy
CCR Anchor Standards for Reading[a]	CCR Anchor Standards for Reading[a]
1. Reading for Literature	6. Reading in History/Social Studies
2. Reading for Informational Texts	7. Reading in Science and Technical Subjects
CCR Anchor Standards for Writing[b]	CCR Anchor Standards for Writing[b]
3. Writing	8. Writing in History/Social Studies, Science, and Technical Subjects
CCR Anchor Standards for Speaking and Listening	
4. Speaking and Listening	
CCR Anchor Standards for Language	
5. Language	

[a]The 10 reading CCR anchor standards are the same for the English language arts and literacy strands.
[b]The 10 writing CCR anchor standards are the same for English language arts and literacy strands.

which we refer to as topics. Additionally, half of the Common Core ELA strands contain statements that are organized below the standard level, as sub-standards. For the purposes of the study, these were rated as though they were on the same level as standards. Thus the Common Core standards for ELA and literacy comprised 113 ratable statements (see Figure 1).[2]

[2]For the purposes of analysis in the WAT tool, elements in the Common Core standards were organized to fit the Webb labeling structure, which uses only three levels. Common Core strands were labeled as standards, the Common Core topics were labeled as goals, and Common Core standards and sub-standards were both labeled as objectives.

Figure 1. Common Core English Language Arts and Literacy Standards for Grades 11 and 12: Number of Rated Statements



Mathematics

For the Common Core mathematics standards for high school, *conceptual categories* are the highest level of related content. There are six conceptual categories: Number and Quantity, Algebra, Functions, Modeling, Geometry, and Statistics and Probability. There is just one grade band for high school, intended for grades 9–12. The mathematics standards do not have anchor standards as do ELA and literacy. Mathematics is organized into groupings beneath the conceptual category level labeled *domains* and *clusters*. Because many mathematics topics and skills are interconnected across domains, standards from these groupings may sometimes be closely related. One of the conceptual categories – Modeling – has standards that are integrated into other conceptual categories and therefore analyses for the category were not conducted separately. (The modeling standards are indicated in the Common Core document with a star symbol (★).)

All conceptual categories contain standards with sub-standards. As with English language arts and literacy, these were rated as though they were on the same level as standards so that no information would be lost. The Common Core mathematics standards, therefore, had 192 ratable statements (see Figure 2).[3]

The Common Core high school mathematics standards aim to describe the mathematics that students should study in order to be college and career ready (Common Core State Standards Initiative, 2010c). Mathematics standards marked with a (+) represent advanced content and are intended to prepare students for higher-level courses. While not all students would be expected to complete these standards, their content might appear in courses designed for all students. The advanced content standards appear throughout the domains and were rated as all other standards.

[3]For the purposes of the study, Common Core elements were organized to fit the Webb labeling structure, which uses three levels. Common Core conceptual categories were labeled as standards, Common Core clusters were labeled as goals, and Common Core standards and sub-standards were labeled as objectives. The Common Core domain label was not used in the Webb structure, as it is a broad description of the more detailed levels that follow.

Figure 2. Common Core Mathematics Standards for High School: Number of Rated Statements

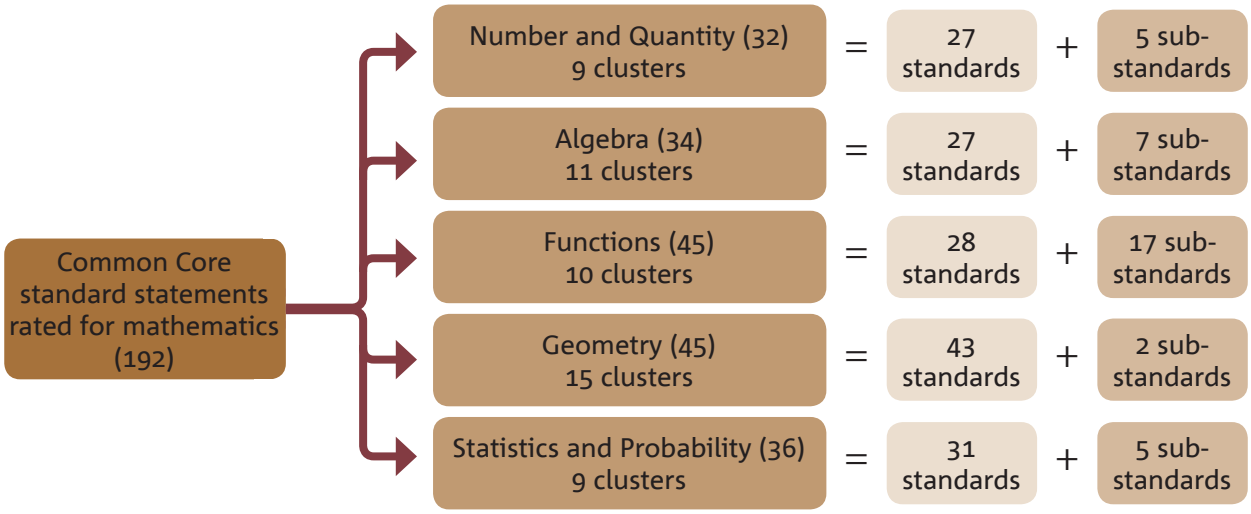


Table 2. Descriptive Information About the Five Comparison Standards Sets for English Language Arts (ELA) and Literacy

ELA comparison standards sets	Number of comparison standards
California ELA standards for grades 11–12	108
Massachusetts ELA standards for grades 11–12	41
Texas ELA and cross-disciplinary college and career readiness standards	89 (45 are cross-disciplinary)
Knowledge and Skills for University Success ELA college and career readiness standards	73
International Baccalaureate ELA standards for grades 10–12	49

The Common Core mathematics standards include eight Standards for Mathematical Practice. These hone in on "processes and proficiencies" with longstanding importance in mathematics education (Common Core State Standards Initiative, 2010c), such as problem solving, reasoning and proof, communication, representation, adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and the inclination to see mathematics as sensible and useful. The Standards for Mathematical Practice are explained at the beginning of the Common Core standards document and then presented again on each conceptual category overview page. In general, because they are not laid out as specific standards, the practices were not rated in this study. However, one of the practices is making mathematical models and specific modeling standards appear in the Common Core document.

Table 3. Descriptive Information About the Five Comparison Standards Sets for Mathematics

Mathematics comparison standards sets	Number of comparison standards
California mathematics standards for grades 8–12	185
Massachusetts mathematics standards for grades 9–12	103
Texas mathematics and cross-disciplinary college and career readiness standards	115 (45 are cross-disciplinary)
Knowledge and Skills for University Success mathematics college and career readiness standards	83
International Baccalaureate mathematics standards for grades 10–12	189

Rating of Comparison Standards

The five sets of comparison standards are as follows:

- The Content Standards for California Public Schools, for the 11th–12th-grade band in English language arts and for the 8th–12th-grade band in mathematics (1997)
- The Massachusetts Curriculum Frameworks, for the 11th–12th-grade band in English language arts (2001) and mathematics (2000)
- The Texas College and Career Readiness Standards in English language arts, mathematics, and cross-disciplinary standards (2008)
- The Knowledge and Skills for University Success (KSUS) standards in English and mathematics,[4] developed as college-preparatory standards by Standards for Success
- The International Baccalaureate (IB) Diploma Programme English language arts and mathematics standards, developed by EPIC, for IB's Programs of Study for 10th–12th-grades[5]

Among the five sets, the number of comparison standards in ELA and literacy ranged between 41 and 108. The number of comparison mathematics standards ranged between 83 and 189. In some instances, the lowest level for rating was not the very smallest grain size within the sets of comparison standards but rather the level that had consistent detail for the purpose of alignment. Tables 2 and 3 break down the number of ratable statements for each of the comparison standards sets for ELA and literacy and mathematics.

[5]These did not include the Knowledge and Skills Foundations within the English and mathematics sections.
[6]Note that the study did not include any content from IB "options." These are additional required components, which each IB school selects. The number of options varies by course and by subject. The IB options do not have specific standards.

Rater Reliability

Reliability statistics were in the acceptable range for all Depth of Knowledge ratings. For each set of comparisons we examined the intraclass correlation, which calculates agreement, accounting for the possibility of agreement by chance and ratings that are close but not an exact match (Shrout and Fleiss, 1979). In this context, values of .60 or larger indicate reasonable level of agreement, and values of .70 or larger indicate a good level of reliability (Cook & Wilmes, 2007). For ELA and literacy, the intraclass correlation was close to .70 for one comparison and above .85 for the other four comparisons. The correlations range from .68 to .94 (see Table 4).

For mathematics, the intraclass correlations were close to or above .80 for each set, ranging from .78 to .87 (see Table 5).

Rater consistency data were examined for variance and errant coding to determine if any single rater was skewing reliability and therefore warranted removal from the analysis data. No such pattern was found and all data from all raters were retained.

Table 4. Consistency of Depth of Knowledge Ratings Across Nine Raters for English Language Arts and Literacy

Comparison standard set	Number of standards	Intraclass correlation
California	108	0.91
Massachusetts	41	0.93
Texas and College and Career Readiness	89	0.86
Knowledge and Skills for University Success	73	0.94
International Baccalaureate	49	0.68

Table 5. Consistency of Depth of Knowledge Ratings Across Seven Raters for Mathematics

Comparison standard set	Number of standards	Intraclass correlation
California	185	0.87
Massachusetts	103	0.83
Texas and College and Career Readiness	115	0.81
Knowledge and Skills for University Success	83	0.85
International Baccalaureate	189	0.78

Figure 3. Illustration of Categorical Concurrence Statistic

Data Analysis

Categorical Concurrence

Webb's Categorical Concurrence statistic measures the average number of comparison standards from one set of standards that raters match to specific standards from the reference set of standards. In the current study, Categorical Concurrence is the mean number of matches between each set of comparison standards and the Common Core standards. It is measured for each content-specific area of the Common Core standards, namely the eight strands in English language arts and literacy and the five conceptual categories in mathematics. If, on average across all raters, at least one standard in the content-specific area of the Common Core was matched to a standard in the comparison standard set, the criterion for that content-specific area is met. In test items-to-standards alignment, at least six test items must match in order to meet the criterion (Webb et al., 2005). This number is necessary due to the specificity of test items, in that no single test item is expected to comprehensively assess an entire standard. In standards-to-standards alignment, however, standards tend to be broad statements describing skills and knowledge, and a single correspondence between two sets of standards for a content area is considered sufficient to meet the criterion (Cook, 2005). Figure 3 illustrates this criterion graphically.

Depth of Knowledge Consistency

Depth of Knowledge (DOK) is determined by having all raters assign one of four levels of cognitive complexity (Webb, 1997) to each Common Core standard and each standard in the five comparison standards sets. Webb outlined the following levels:

Level 1: Recall and reproduction

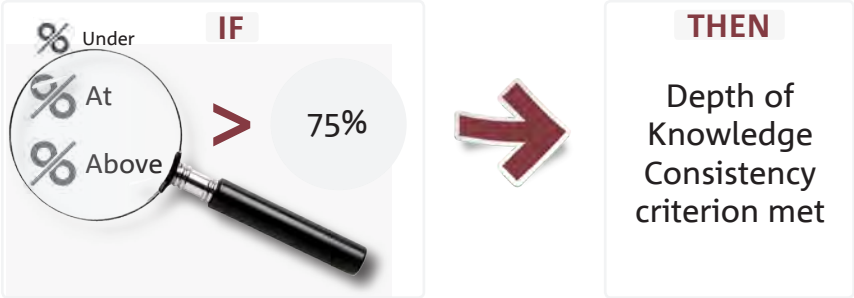
Level 2: Skills and concepts

Level 3: Strategic thinking

Level 4: Extended thinking

Level 1 content and skills require recall of information, such as reciting a fact or performing a simple procedure. Level 2 skills involve more than one mental step, such as making a decision on how to approach a problem before solving it. In Level 3, the cognitive demands are complex and abstract; the content requires deep understanding exhibited through planning and use of evidence. Level 4 content, with the highest cognitive demand, requires students to make connections, relate ideas, and select one approach among many alternatives (Webb et al., 2005).

Figure 4. Illustration of Depth of Knowledge Consistency Statistic

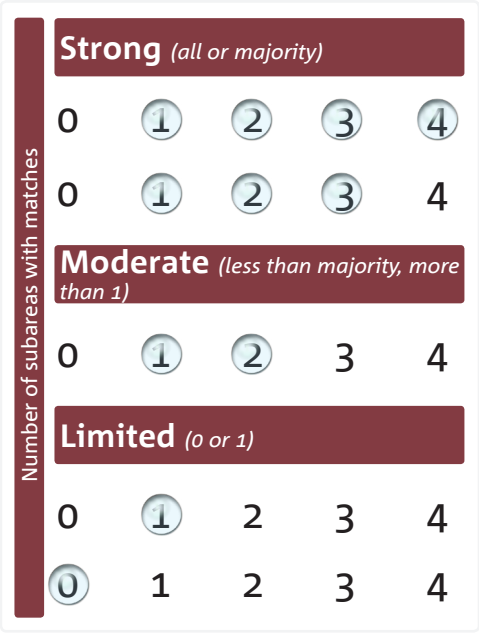


Once raters gave all standards a DOK rating, we calculated the DOK Consistency statistic for each Common Core content-specific area. The statistic involves comparing the DOK ratings of Common Core standards that had been matched to comparison standards and the DOK ratings of the standards that had been matched. We set an a priori threshold of 75% for the DOK Consistency criterion. This means that, for each Common Core content-specific area, if more than 75% of the matched comparison standards were at or above the DOK of the corresponding Common Core standard, then the criterion is met. For test items-to-standards alignment, researchers typically use a 50% DOK criterion (Webb, 1999) based on the fact that a substantial number of test items are supposed to reflect the standards, and greater match is required for categorical concurrence (Cook, 2005). For standards-to-standards comparisons, since the match requirement is less, the 50% criterion is insufficient. Therefore, a 75% DOK criterion has typically been adopted for standards-to-standards alignment (Cook, 2005). Figure 4 shows this graphically. For information on the specific details of this calculation, see Appendix A.

Breadth of Coverage

Breadth of Coverage is a measure of dispersion that shows the extent to which matched comparison standards cover a similar scope of content as that found in the reference standards. Specifically in this study, the statistic was used to calculate the number of content elements (subareas) in the Common Core standards that are covered by matched standards in the comparison standard set. For ELA and literacy, we refer to the subareas as topics. For mathematics, the subareas are referred to as clusters in the Common Core standards. When more subareas[6] have matching standards, then greater breadth of coverage exists. Specifically, the coverage statistic uses the number of subareas within a Common Core content-specific area that have standards matched with comparison standards. A strong coverage score for a content-specific area means a majority of the subareas in that Common Core content-specific area match with the comparison standard set. Moderate coverage means that more than one subarea matches for the content-specific area. Limited coverage means that within a content-specific area, one or no subarea matches to the Common Core standards. Figure 5 illustrates this criterion.

Figure 5. Illustration of Coverage Statistic



[6]Webb uses the term "goal" here as a generic term. To reduce confusion, we use terms specifically related to the organization of the Common Core standards.

Chapter 3 | Results for English Language Arts and Literacy

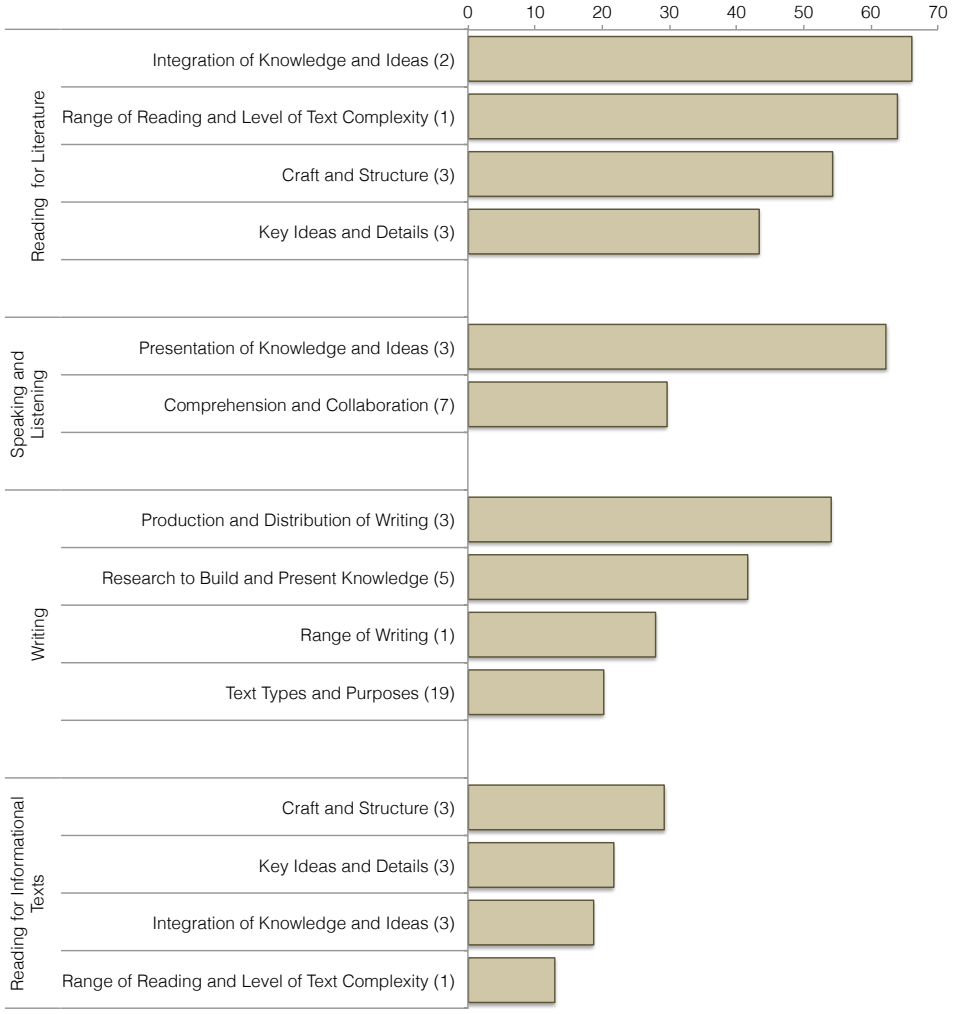
Results below describe the match between the Common Core English language arts (ELA) and literacy standards and the five sets of comparison standards. Because the Webb methodology calculates alignment at the highest level, results are generally presented at the strand level.

Match

Overall Match of Comparison Standards to the Common Core Standards

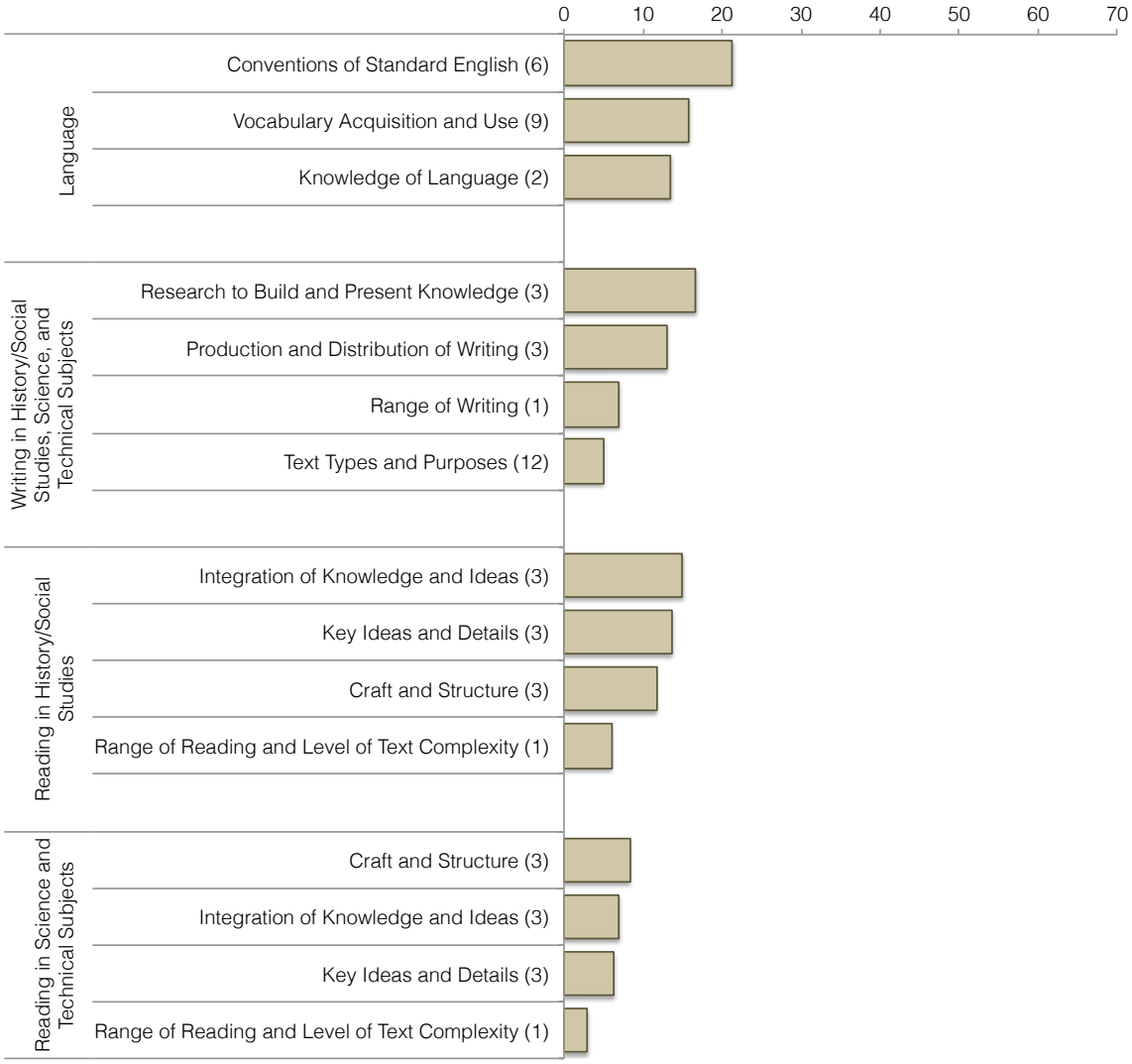
Figures 6 and 7 show the average number of matches per Common Core standard in each topic across all comparison standards. Both the strands and topics within a strand are sorted in descending order according to frequency. Figure 6 shows the first four strands and Figure 7 shows the second four strands. The graphs reveal certain tendencies between strands (e.g., more comparison standards matched for Reading for Literature than for Reading for Informational Texts). They also show trends within strands (e.g., one of the topics in Speaking and Listening has many more matching standards than the other topic).

Figure 6. Average Number of Matches per Standard Across All Comparison Standards, by Topic



Note: Numbers in parentheses indicate how many standards statements appear within the topic.

Figure 7. Average Number of Matches per Standard Across All Comparison Standards, by Topic



Note: Numbers in parentheses indicate how many standards statements appear within the topic.

Match for Each Comparison Set to the Common Core Standards

Table 6 presents the average number of matches per strand between the Common Core standards for each set of comparison standards. The data illustrate that there is a wide range in the number of average matches and that some strands have high standard deviations, indicating that raters varied widely in the number of matches they identified.

Table 6. Average Number of Matches for English Language Arts (ELA) and Literacy Common Core Strands Across All Comparison Standards

Common Core ELA and literacy strands	Average number of matches									
	CA		MA		TCCRS		KSUS		IB	
	M	SD	M	SD	M	SD	M	SD	M	SD
Reading for Literature	15.7	10.93	10.0	4.00	10.0	5.85	10.8	8.24	8.0	4.00
Reading for Informational Texts	6.0	3.74	5.0	2.32	9.9	3.21	2.7	4.09	1.1	1.41
Writing	20.4	11.88	8.6	2.83	21.8	10.23	18.9	9.00	17.1	8.35
Speaking and Listening	16.9	11.03	5.0	2.83	14.7	6.78	3.0	4.86	4.2	3.96
Language	4.9	1.97	8.2	2.39	8.6	4.27	11.1	7.36	0.2	0.78
Reading in History/Social Studies	6.2	5.24	0.6	1.21	3.6	3.23	2.3	2.69	1.4	3.38
Reading in Science and Technical Subjects	1.0	1.79	0.2	0.78	4.7	2.91	1.0	3.46	0.7	1.94
Writing in History/Social Studies, Science, and Technical Subjects	2.2	3.03	1.0	2.45	6.1	6.44	5.9	17.15	2.1	6.98
Total	**73.3**	**44.14**	**73.3**	**44.14**	**79.2**	**28.02**	**55.7**	**37.15**	**34.9**	**19.51**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate.

Categorical Concurrence Statistic

Recall that a single correspondence in a content area between two sets of standards is considered sufficient to meet the standards-to-standards alignment criterion (Cook, 2005). Thus, overall the criterion for Categorical Concurrence between the Common Core and the five sets of comparison standards is met frequently. On average across raters, at least one standard from every set of the five comparison standards is matched to a standard in all Common Core strands, with few exceptions. This indicates overlap between the knowledge and skills specified in the Common Core standards and the content of the comparison standards. Table 7 shows the Common Core strands for which the Categorical Concurrence criterion is met across the five sets of comparison standards.

Table 7. Categorical Concurrence for English Language Arts (ELA) and Literacy

Common Core ELA and literacy strands	CA	MA	TCCRS	KSUS	IB
Reading for Literature	●	●	●	●	●
Reading for Informational Texts	●	●	●	●	●
Writing	●	●	●	●	●
Speaking and Listening	●	●	●	●	●
Language	●	●	●	●	○
Reading in History/Social Studies	●	○	●	●	●
Reading in Science and Technical Subjects	●	○	●	●	○
Writing in History/Social Studies, Science, and Technical Subjects	●	●	●	●	●

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate.
● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
○ Does not meet the criterion for Categorical Concurrence.

The criterion is met for all (eight of eight) Common Core ELA and literacy strands for the California standards, Texas College and Career Readiness Standards, and the Knowledge and Skills for University Success. The criterion is met for six of eight Common Core ELA and literacy strands for the Massachusetts and International Baccalaureate standards.

For the Massachusetts standards, the criterion is not met for the Common Core Reading Standards in History/Social Studies and the Reading Standards in Science and Technical Subjects. Table 6 shows why the criterion is not met for each of these two areas. For the Massachusetts standards, there is an average of 0.6 standards (*SD* = 1.21) that match with the Reading Standards in History/Social Studies. There is an average of 0.2 standards (*SD* = .78) that match with the Reading Standards in Science and Technical Subjects.

For the International Baccalaureate standards, the criterion is not met for the Common Core Language Standards and Reading Standards in Science and Technical Subjects. There is an average of 0.2 standards (*SD* = .78) that match with the Common Core Language Standards and an average of 0.7 standards (*SD* = 1.94) that match with Reading Standards in Science and Technical Subjects.

Among the sets of comparison standards for which all criteria are met, there is a wide range in the number of average matches (see Table 6). As an example, for the California standards, raters identified an average of 1.0 standard (*SD* = 1.79) that matches with the Common Core Reading Standards in Science and Technical Subjects and an average of 20.4 standards (*SD* = 11.88) that match with the Writing Standards. Both of these meet the criterion.

In Appendix C, there is more detailed discussion about each set of comparison standards and how it aligns to the Common Core. The precise correspondence of matches between the Common Core standards and individual comparison sets of standards is provided in the Technical Supplement.

Depth of Knowledge

Ratings for Common Core Standards

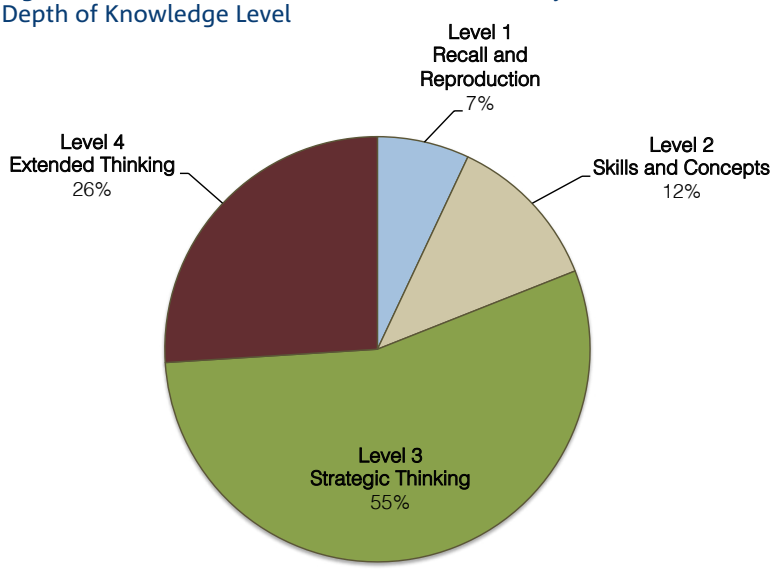
Table 8 shows the modal Depth of Knowledge (DOK) rating for each of the Common Core English language arts (ELA) and literacy strands. Most represent the strategic thinking level of cognitive demand (level 3). As the table shows, the Language Standards have lower ratings than the other strands (mode of level 2). This might be because the strand contains elements of grammar, conventions, and usage, which do not tend to involve abstract and complex thinking.

Table 8. Depth of Knowledge (DOK) Modal Ratings for English Language Arts and Literacy Common Core Strands

Common Core ELA and literacy strand	DOK mode
Reading for Literature	3
Reading for Informational Texts	3
Writing	3
Speaking and Listening	3
Language	2
Reading in History/Social Studies	3
Reading in Science and Technical Subjects	3
Writing in History/Social Studies, Science, and Technical Subjects	3

At the standard level, the Common Core standards fall across the full range of the DOK scale, but less frequently at the lower levels of the scale. Overall, only 7% of the standards are at a level 1 (recall and reproduction), 12% are at a level 2 (skills and concepts), 55% are at a level 3 (strategic thinking), and 26% are at level 4 (extended thinking). This summary information is presented graphically in Figure 8. DOK ratings for all standards are provided in Appendix B.

Figure 8. Percent of Common Core ELA and Literacy Standards at each Depth of Knowledge Level



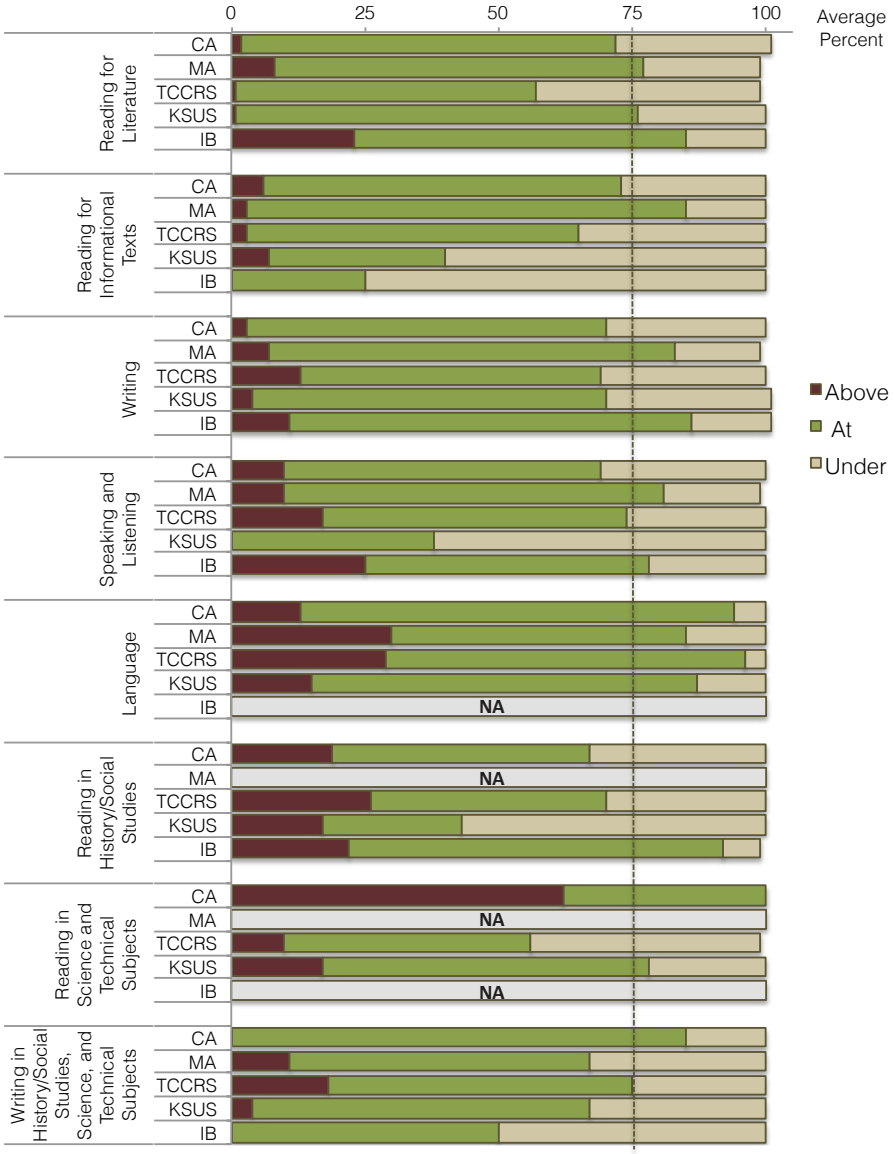
DOK Consistency of Each Comparison Set to the Common Core Standards

DOK Consistency describes the extent to which the ELA and literacy standards that experts matched between the comparison sets and the Common Core are consistent in level of cognitive demand. Meeting this criterion requires more than 75% of the comparison standards matching for the content area to be at or above the level of cognitive demand of the Common Core standards. Consistency is only computed for those content-specific areas for which the Categorical Concurrence criterion is met.

Figure 9 shows, for each comparison set, the percent of standards (averaged across raters; see Appendix A) that fell above, at, and under the cognitive demand level of the Common Core standards. In the figure, a line is drawn at 75%, which is the criterion for the percent of standards falling above or at the cognitive demand level of the Common Core in order to meet the DOK Consistency statistic. Findings for the DOK Consistency statistic are inconsistent across the different comparison sets and different strands. Overall, the Common Core strand for which the DOK criterion is most often met is the Language Standards strand, indicating that the matched comparison standards are at or above the DOK of the Common Core Language Standards. The strands for which the criterion is met for less than half of the comparison standards sets are the Reading Standards for Informational Texts, the Writing Standards, the Speaking and Listening Standards, the Reading Standards in History/Social Studies, the Reading Standards in Science and Technical Subjects, and the Writing Standards in History/Social Studies, Science, and Technical Subjects. For these strands, there are more comparisons for which the Common Core standards are rated at a higher level in terms of cognitive demand. As Figure 9 shows, some standards sets fall just above or just below 75% for some strands and results would be different if an alternative criterion had been selected.

Looking at DOK Consistency across the comparison sets of standards, the criterion is met most often for the Massachusetts standards (for five out of six strands that fulfill the Categorical Concurrence criterion). This suggests that for ELA and literacy, the cognitive demand of the Massachusetts standards is similar to or more cognitively complex than the Common Core standards. The International Baccalaureate standards meet the criterion for four out of six strands that fulfill the Categorical Concurrence criterion. For the other three sets (California, Texas College and Career Readiness, and Knowledge and Skills for University Success), the criterion is met for two or three of eight strands that fulfill the Categorical Concurrence criterion.

Figure 9. Depth of Knowledge Level Comparisons of the Five Sets of Comparison Standards to Common Core ELA and Literacy Standards



Note: Total percent may equal slightly above or below 100 due to rounding.

Breadth of Coverage

Breadth of Coverage gives information on the breadth or dispersion of corresponding standards across standards sets. A comparison set of standards could have a high degree of concurrence with reference standards but still not cover the entire scope or breadth of content of the reference standards. In this study, the criterion is related to the number of Common Core topics within a strand for which a set of comparison standards has matches to the Common Core standards. Strong coverage means that a majority of topics in the strand have matches. Moderate coverage means that more than one topic in the strand has matches. Limited coverage means that one or fewer than one topic in the strand has matches. If coverage is limited, this indicates that comparison content tends to concentrate in particular topics of the Common Core strand, according to the way the Common Core standards are organized. Therefore, other categories of content are not covered by the comparison standards.

For the most part, coverage between the Common Core standards and the comparison standards was consistently strong or broad (see Table 9). Most sets of comparison standards cover a majority of Common Core topics for each strand. There

were a few exceptions. For the Massachusetts standards, the Reading Standards in Science and Technical Subjects strand has moderate coverage. For the International Baccalaureate standards, the Reading Standards for Informational Texts strand also has moderate coverage and the Language Standards strand has limited coverage. Two of these (the Massachusetts reading strand and the International Baccalaureate language strand) also do not meet the Categorical Concurrence criterion, which suggests that the lower number of average matches for these strands may have limited coverage. However, this is not a necessary relationship because there are also two strands for which the Categorical Concurrence criterion is not met but that still have strong coverage (Reading Standards in History/Social Studies for Massachusetts and Reading Standards in Science and Technical Subjects for International Baccalaureate).

Appendix D presents more information about the distribution of standard matches within each of the eight ELA and literacy strands.

Table 9. Breadth of Coverage Criterion for English Language Arts and Literacy

Common Core ELA and literacy strand	CA	MA	TCCRS	KSUS	IB
Reading for Literature	●	●	●	●	●
Reading for Informational Texts	●	●	●	●	○
Writing	●	●	●	●	●
Speaking and Listening	●	●	●	●	●
Language Standards	●	●	●	●	●
Reading in History/Social Studies	●	●	●	●	●
Reading in Science and Technical Subjects	●	○	●	●	●
Writing in History/Social Studies, Science, and Technical Subjects	●	●	●	●	●

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate.
● means that a majority of topics in the Common Core strand have at least one matched comparison standard;
○ means that one topic in the Common Core strand have at least one matched comparison standard;
● means that one or fewer than one topic in the Common Core strand have at least one matched comparison standard.

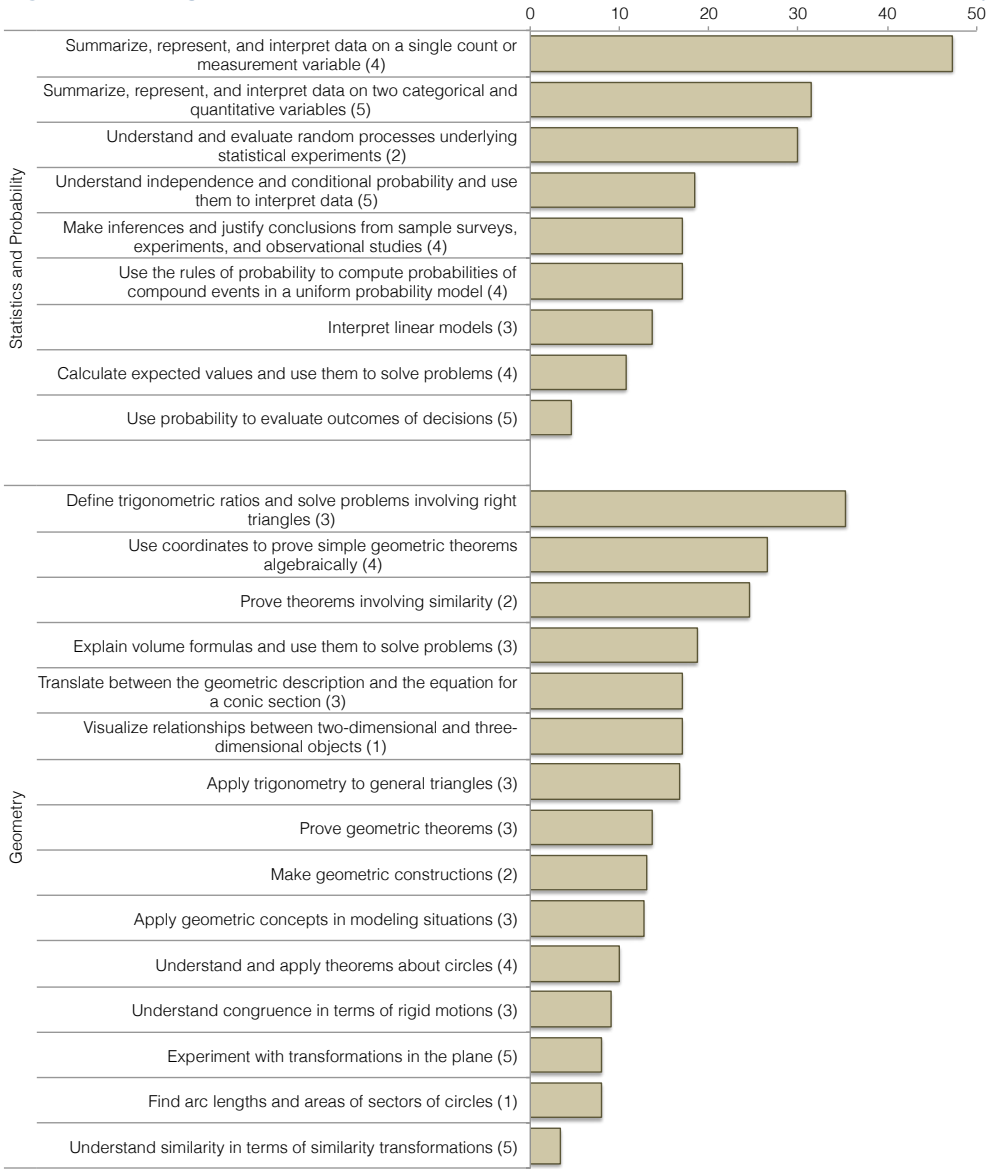
Results below describe the match between the Common Core mathematics standards and the five sets of comparison standards. Results are generally presented at the conceptual category level.

Match

Overall Match of Comparison Standards to the Common Core Standards

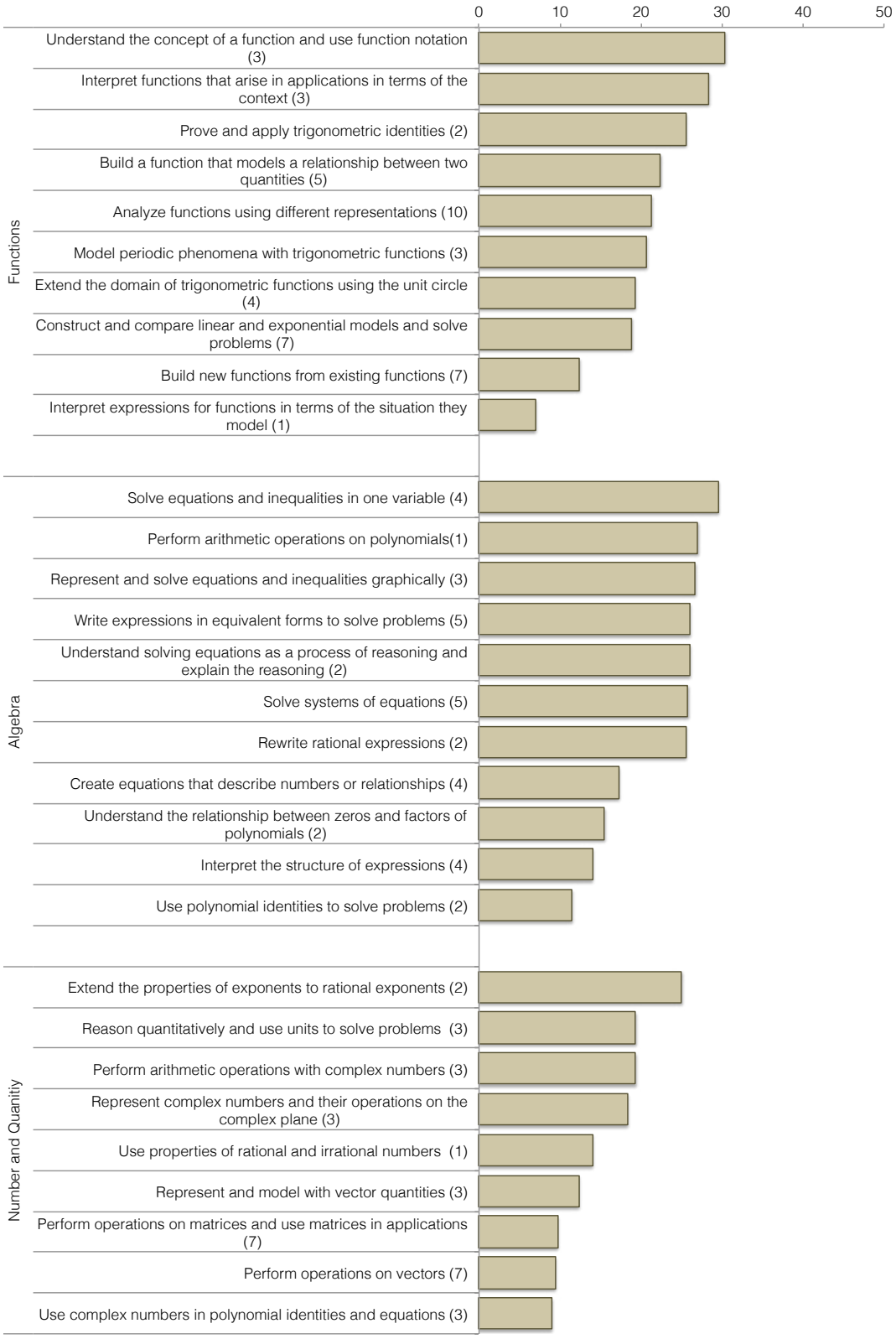
Figures 10 and 11 show the average number of matches per Common Core standard in each cluster across all comparison standards. Both the conceptual categories and clusters within a category are sorted in descending order according to frequency. Figure 10 provides the information for Statistics and Probability, and Geometry. Figure 11 provides the information for Functions, Algebra, and Number and Quantity. The graphs show tendencies between and within conceptual categories.

Figure 10. Average Number of Matches per Standard Across All Comparison Standards, by Cluster



Note: Numbers in parentheses indicate how many standards statements appear within the cluster.

Figure 11. Average Number of Matches per Standard Across All Comparison Standards, by Cluster



Note: Numbers in parentheses indicate how many standards statements appear within the cluster.

Match for Each Comparison Set to the Common Core Standards

Table 10 shows the average number of matches per conceptual category between the Common Core standards and each set of comparison standards for mathematics. Generally, all categories for all standards sets have a relatively high number of matches. As with English language arts and literacy, some categories have very high standard deviations, indicating that raters varied widely in the number of matches they identified.

Categorical Concurrence Statistic

Because a single correspondence in a content area between two sets of standards is considered sufficient to meet the standards-to-standards alignment criterion (Cook, 2005), the criterion for Categorical Concurrence is met for every conceptual category for every comparison standard set. Across raters, more than one standard from every set of the five comparison standards on average is matched to a Common Core standard (see Table 11).

In Appendix C, there is more detailed discussion for each set of comparison standards and how it aligns to the Common Core. The precise correspondence of matches between the Common Core standards and individual comparison sets of standards is provided in the Technical Supplement.

Table 10. Average Number of Matches for Mathematics Common Core Standards Across Five Sets of Standards

Common Core mathematics conceptual category	Average number of matches									
	CA		MA		TCCRS		KSUS		IB	
	M	SD	M	SD	M	SD	M	SD	M	SD
Number and Quantity	15.9	9.85	16.7	9.07	6.9	4.05	5.0	4.95	17.4	9.75
Algebra	32.4	22.23	23.1	10.47	17.9	19.54	19.0	18.35	17.0	12.66
Functions	25.9	18.44	27.7	14.70	21.1	11.75	17.4	13.32	38.9	23.27
Geometry	26.3	18.76	24.0	14.81	18.9	10.16	14.9	11.01	12.0	7.73
Statistics and Probability	21.1	14.00	17.4	8.78	31.9	19.69	4.6	2.61	30.9	18.47
Total	**121.6**	**81.18**	**109.0**	**56.23**	**96.6**	**60.86**	**60.9**	**45.49**	**116.1**	**65.73**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate.

Table 11. Categorical Concurrence for Mathematics

Common Core mathematics conceptual category	CA	MA	TCCRS	KSUS	IB
Number and Quantity	●	●	●	●	●
Algebra	●	●	●	●	●
Functions	●	●	●	●	●
Geometry	●	●	●	●	●
Statistics and Probability	●	●	●	●	●

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate.
● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
● Does not meet the criterion for Categorical Concurrence.

Depth of Knowledge

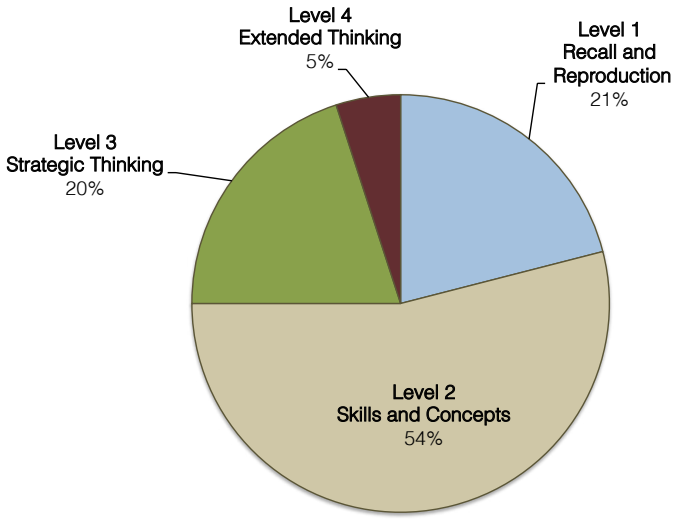
Ratings for Common Core Standards

Table 12 shows the modal Depth of Knowledge (DOK) rating for each of the Common Core mathematics conceptual categories. Three categories represent the skills and concepts level of cognitive demand (level 2). In the Number and Quantity category, which has a mode of level 1 (recall and reproduction), the standards involve such skills as explaining properties (of irrational exponents, rational and irrational numbers) and performing arithmetic operations (with complex numbers, vectors, and matrices). These skills may be more oriented toward one-step recall or problem solving. In the Geometry category, the standards involve such skills as proving theorems, deriving equations, and using experimentation to verify concepts such as similarity. Such skills may lend themselves more toward strategic and extended thinking, which could explain why the mode rating for that content-specific area was at level 3 (strategic thinking).

Table 12. Depth of Knowledge (DOK) Modal Ratings for Mathematics Common Core Conceptual Categories

Common Core mathematics conceptual category	DOK mode
Number and Quantity	1
Algebra	2
Functions	2
Geometry	3
Statistics and Probability	2

Figure 12. Percent of Common Core Mathematics Standards at each Depth of Knowledge Level



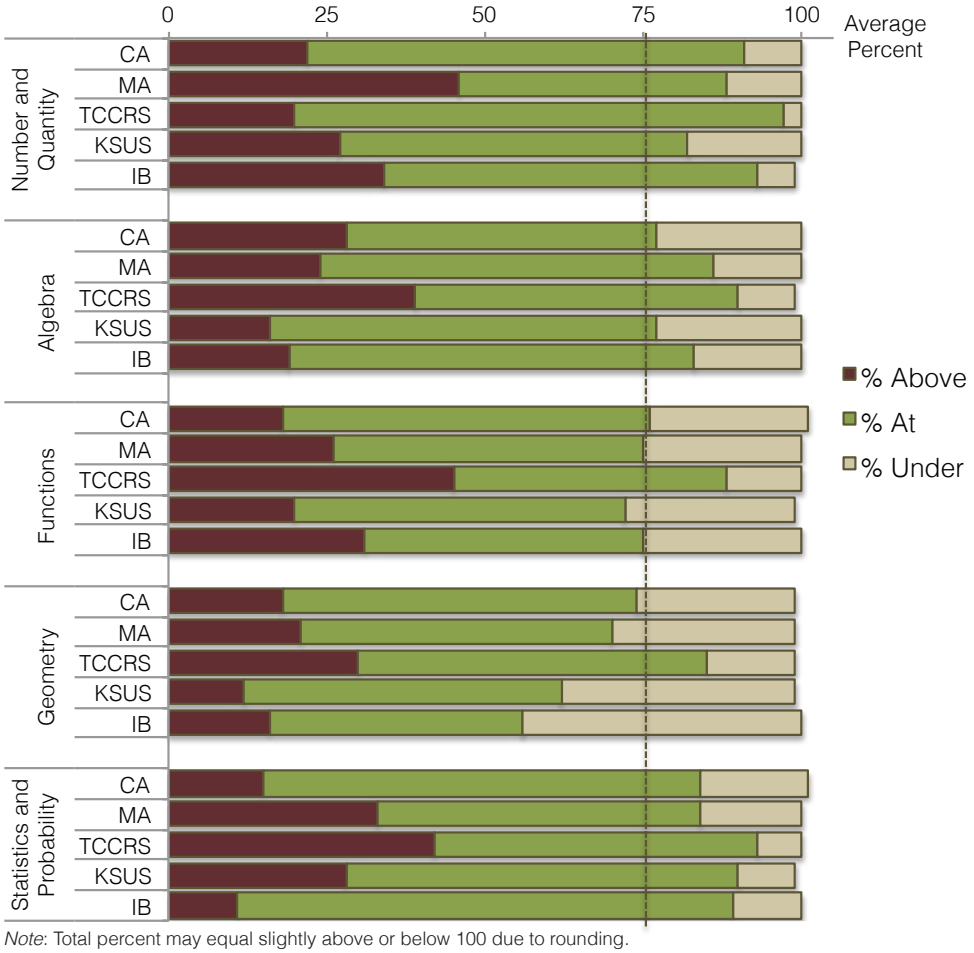
At the standard level, the Common Core mathematics standards cover a somewhat broader range of cognitive complexity than the ELA and literacy Common Core standards with fewer at the highest level. The majority of the Common Core mathematics standards are rated as skills and concepts (level 2). Overall, 21% are at a level 1 (recall and reproduction), 54% are at a level 2 (skills and concepts), 20% are at a level 3 (strategic thinking), and 5% are at level 4 (extended thinking). Figure 12 summarizes this information. DOK ratings for all standards are provided in Appendix B.

As mentioned earlier, the Standards for Mathematical Practice within the Common Core standards were not rated for the purposes of this study. The Mathematical Practices are designed for educators to apply across all Common Core mathematics standards. Thus, using the mathematics practices in the application and use of the other Common Core mathematics standards could conceivably lead to different levels of cognitive demand than those presented here.

DOK Consistency of Each Comparison Set to the Common Core Standards

Figure 13 shows, for each comparison set, the percent of standards (averaged across raters, see Appendix A) that fell above, at, and under the cognitive demand level of the Common Core standards. In the figure, a line is drawn at 75%, which is the criterion for the number of standards falling above or at the cognitive demand level of the Common Core in order to meet the DOK Consistency statistic. For the Number and Quantity, Algebra, and Statistics and Probability conceptual categories all sets of standards meeting the Categorical Concurrence criterion also meet the DOK criterion. For Geometry, only the Texas College and Career Readiness standards were at or above the cognitive demand of the Common Core standards. For Functions, three of five sets of standards that meet the Categorical Concurrence criterion meet the DOK criterion. These results suggest that for every mathematics conceptual category, the Texas College and Career Readiness standards tend to be similar to or more cognitively complex than the Common Core standards. The California state standards and the Massachusetts state standards are similar to or more cognitively complex than the Common Core standards for four out of five conceptual categories that show categorical concurrence. Figure 13 illustrates these findings. The figure also shows that some standards sets fall just above or just below 75% for some categories and results would be different if an alternative criterion had been selected.

Figure 13. Depth of Knowledge Level Comparisons of the Five Sets of Comparison Standards to Common Core Mathematics Standards



Note: Total percent may equal slightly above or below 100 due to rounding.

Breadth of Coverage

For mathematics, the Breadth of Coverage criterion is related to the number of Common Core clusters within a conceptual category for which a set of comparison standards has matches to the Common Core standards. Strong coverage means a majority of clusters have matches for the conceptual category. Moderate coverage means that more than one cluster has matches for the conceptual category. Limited coverage means that fewer than one cluster or no cluster has matches for the conceptual category.

Coverage in mathematics across the comparison standards was consistently strong, indicating that matching content for each comparison set of standards was dispersed across the clusters of the Common Core standards (see Table 19).

Table 19. Breadth of Coverage Criterion for Mathematics

Common Core mathematics conceptual category	CA	MA	TCCRS	KSUS	IB
Number and Quantity	●	●	●	●	●
Algebra	●	●	●	●	●
Functions	●	●	●	●	●
Geometry	●	●	●	●	●
Statistics and Probability	●	●	●	●	●

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate.
● means that a majority of clusters in the Common Core conceptual category have at least one matched comparison standard;
● means that more than one cluster in the Common Core conceptual category have at least one matched comparison standard;
● means that one or fewer than one cluster in the Common Core conceptual category have at least one matched comparison standard.

Appendix D presents more information about the distribution of standard matches within each of the five Common Core mathematics conceptual categories.

Chapter 5 | Summary and Discussion

In this chapter we review the purpose of the study, discuss the method chosen to obtain data necessary to answer the three research questions, introduce implications of the findings, and offer suggestions for future research.

The study addresses three research questions:

1. To what extent are the knowledge and skills found in the comparison standards the same as or different from what is described in the Common Core standards? (match)
2. What is the cognitive complexity level of the Common Core standards and to what extent are the matched comparison standards at a higher or lower level of cognitive complexity? (depth)
3. How broadly do the matched comparison standards cover the content of the Common Core standards? (breadth)

The reason for asking these questions is that states are concerned about the rigor of the Common Core standards and the comparison of the Common Core standards to existing standards. Because the Common Core standards sponsors explicitly intended the standards to be at the level of readiness for college and careers, we compared the Common Core standards to five sets of comparison standards that are considered rigorous and, in two cases, are explicitly designated as college and career readiness standards. The two states deemed to have standards that have been recognized as rigorous or otherwise exemplary are California and Massachusetts. The two sets of college and career readiness standards are the Texas College and Career Readiness Standards and the Knowledge and Skills for University Success. Finally, we included an internationally-grounded set of standards from the International Baccalaureate (IB) Diploma Programme.

We measured alignment using three metrics from a modified version of the Webb (1997; 1999; 2002a) method designed to determine standards-to-standards alignment (Cook, 2007; Cook & Wilmes, 2007). The metrics provide a means to quantify and evaluate the extent of overlap between different sets of standards in terms of knowledge, skills, and content. Where overlap exists, the matching standards are then compared to determine relative cognitive demand. The third metric determines breadth of overlap, or coverage, for matching standards. All three metrics are calculated at the highest level of organization for the Common Core (eight strands for English Language Arts (ELA) and literacy; five conceptual categories for mathematics) because the study's goal is to provide an initial high-level view of the relationship between the Common Core standards and other standard systems, not to engage in fine-grained comparisons.

The overall results of the study, as summarized in Table 20, suggest substantial concurrence between the Common Core standards and the comparison standards, with somewhat greater overlap in mathematics than in ELA and literacy. For ELA and literacy, 36 of 40 analyses at the strand level meet the Categorical Concurrence criterion. The "meets" criterion is relatively modest, namely, one or more correspondences between two sets of standards (Cook, 2005). However, for 19 of these comparisons, the mean number of matching standards is above six (six matches is a common criterion for alignment studies that examine concurrence between test items and standards). In places, the number of matches exceeds 20. For mathematics, 25 of 25 analyses at the conceptual category level meet the Categorical Concurrence criterion. For 23 of these comparisons, the mean number of matching standards is above six, in places exceeding 30 matches.

Table 20. Summary of Alignment Findings for Five Sets of Standards Compared to the Common Core Standards

	Common Core content-specific areas	Comparison standards				
		CA	MA	TCCRS	KSUS	IB
English language arts and literacy	Reading for Literature	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage
English language arts and literacy	Reading for Informational Texts	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Moderate coverage
English language arts and literacy	Writing	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage
English language arts and literacy	Speaking and Listening	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage
English language arts and literacy	Language	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	NA; Limited or no coverage
English language arts and literacy	Reading in History/Social Studies	Categorical Concurrence; Strong coverage	NA; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage
English language arts and literacy	Reading in Science and Technical Subjects	Categorical Concurrence; Depth of Knowledge; Strong coverage	NA; Moderate coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	NA; Strong coverage
English language arts and literacy	Writing in History/Social Studies, Science, and Technical Subjects	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Strong coverage
Mathematics	Number & Quantity	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage
Mathematics	Algebra	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage
Mathematics	Functions	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Strong coverage
Mathematics	Geometry	Categorical Concurrence; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Strong coverage	Categorical Concurrence; Strong coverage
Mathematics	Statistics & Probability	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage	Categorical Concurrence; Depth of Knowledge; Strong coverage

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate.

Key

- Categorical Concurrence met
- Depth of Knowledge met
- Strong coverage
- Moderate coverage
- Limited or no coverage

In terms of the cognitive demand of the standards, the findings suggest general consistency between the Common Core standards and the five comparison standard sets. There is somewhat greater correspondence in cognitive depth with the mathematics standards comparisons than the ELA and literacy standards comparisons, a finding consistent with other Common Core alignment work (Porter, McMaken, Hwang, & Yang, 2011).

For cognitive complexity in ELA and literacy, 17 of 36 strand-level analyses indicated that the comparison standard sets were at or above the level of the Common Core standards. In 19 cases, the comparison standard sets tended to be rated lower in cognitive complexity than the Common Core standards. This suggests that, as states transition to the Common Core standards, it will be worthwhile to look closely at the level of cognitive complexity in their current standards in relation to the Common Core standards. States should carefully interpret the complexity of the Common Core standards as they implement curriculum frameworks and develop example materials to put the standards into place. The cognitive complexity of the Common Core ELA and literacy standards in particular will be defined by the actual assignments and assessments given to students (see Beach, 2011). States and groups developing curriculum materials for the Common Core standards need to pay close attention to the cognitive challenge level of these materials to ensure they are sufficiently challenging. This is true

for many of the strands (although the Language Standards are a notable exception, in part because this area tends to require less cognitive depth), but is particularly important to consider when developing materials to teach and assess reading of informational texts and reading and writing for literacy in the content areas.

For mathematics, 19 of 25 conceptual category-level analyses indicate that the comparison standard sets are at or above the level of the Common Core standards. Conversely, six analyses found comparison standard sets to be below the level of the Common Core standards. The Common Core content areas that tended to be higher are the more conceptually-oriented conceptual category of Geometry, and to a lesser degree, Functions.

Overall, the standards from the comparison sets tend to cover the breadth of topics set forth in the Common Core standards. For ELA and literacy, 37 of 40 strand analyses show strong coverage. Another two strand analyses showed moderate coverage and one showed limited coverage. For mathematics, findings suggest that comparison sets show strong coverage in all 25 conceptual category analyses. While every standard in the Common Core standards may not have a match, the topics around which the Common Core standards are organized are reflected in the comparison standards.

The five sets of comparison standards are not fully adequate to account for the content that might be included in every specific state's standards. Among the comparison standards in this study that are considered rigorous and college and career-preparatory, however, the overall findings suggest a general level of agreement between the Common Core standards and the comparison standards regarding what is important for high school students to know in English language arts and mathematics in order to be highly challenged and ready for college and careers.

The purpose of this study was to ascertain alignment, not to judge the quality of any set of standards in relation to any other set of standards. There is no absolute reason that every set of comparison standards must match the Common Core standards in every area in order to be considered high quality standards. Simply because a set of standards lacks a match to the Common Core standards in one or more areas does not mean the comparison standards are inferior or need to be changed to match the Common Core standards. Knowing something about alignment can help in program planning, but is not necessarily the best or only measure of standards quality.

Closing Note From The Authors

The business of analyzing alignment, cognitive challenge, and coverage between sets of standards remains an approximate art, even when ample care is given to control variation and ensure reliable and valid results. This is one of the reasons we offer findings at a high level of aggregation.

We note that another recent study (Porter et al, 2011) used a different method and reached a different conclusion. This study aligned all grade levels of all state standards to the Common Core using the Survey of Enacted Curriculum (SEC), a method that involves comparing sets of standards to a common framework that intersects particular topics with cognitive demand. Data are converted into proportions and an alignment index calculated to assess commonality in content across the two standard sets. Looking at SEC results across all states, the authors conclude that the Common Core standard represent considerable change from current state standards.

In our opinion, it is possible for both studies to be correct in their conclusions. Our study focuses on the macro level to identify general relationships while the Porter et al. study zeroes in at a much more detailed level. As studies of content alignment move to finer grain size, the probability of achieving universal precise matches begins to decrease. This may be particularly true in the case of the Common Core standards, which were intended to be at a more general level and not to specify each and every element students are expected to learn.

We would also note that in a previous study (Conley, Drummond, de Gonzalez, Rooseboom, & Stout, 2011) we found the Common Core standards to be well aligned with a cross-section of 25 entry-level postsecondary course areas. At the same time, different major or fields of study require different combinations of Common Core standards. In other words, it does not appear that there is a magic set of standards that reflect what every student needs to succeed in every postsecondary setting. The fact that the Common Core standards do not align precisely with each state's existing standards should not be cause for undue alarm if states pay attention to another finding from our previous work (Conley, 2005; Conley et al., 2008) that postsecondary instructors indicate that student thinking skills are as important as any particular bit of content knowledge. While all students need a sound academic foundation, the specific knowledge and skills required for post-high school success will vary. The thinking skills and learning strategies that baccalaureate and career-oriented programs require do appear to be more uniform and consistent. The cognitive challenge level of standards and the ways in which they are taught in classrooms will be as

important as the content covered in most cases.

Results from general alignment studies can be informative at a broad level. States still must necessarily engage in a much more fine-grained type of analysis if they want to ascertain the precise relationship between and among each standard in two systems, the existing state standards and the Common Core standards.

Our advice to states is not to lose sight of the forest for the trees. States will be well served to look for patterns along with specific match statistics and address issues of cognitive challenge in particular by the liberal use of example materials and exemplar student work in any standards crosswalk and when the Common Core standards are rolled out statewide. This is true and necessary for both ELA and mathematics. It is perhaps more obvious that the ELA standards will be operationalized not through the literal teaching of the standards statements but through the materials selected to teach the standards at each grade level. As Beach (2011) points out, standards language can be interpreted variably resulting in different translations in different contexts. Educators must make intelligent choices about how students should learn the standards. As we note in the findings section, special attention will need to be paid to informational texts in particular to ensure they reflect a broad range of challenging material and topics.

In mathematics, even though the categorical matches between state standards and the Common Core standards may be very high, it is still worth noting that the cognitive challenge level of these standards will be determined in large measure by the problems students are given to test their knowledge of the many fine-grained and detailed standards. The way the Mathematical Practices standards factor into the Common Core standards poses a challenge to traditional alignment methodology (see Cobb & Jackson, 2011). Although the Mathematical Practices did not lend themselves to inclusion in the current study, they are quite important to keep in mind when considering the intended cognitive challenge level of each of the mathematical standards. The standards authors note the importance of the Mathematical Practice standards and the intent that they be applied to the learning of all of the other mathematics standards. The intention is that in doing so, mathematics will be taught with more robust and complex applications of mathematical processes and principles.

In short, educators should bear in mind the goal of the Common Core standards when considering the mechanics of alignment. That goal is to raise the challenge level for US students, to enable all students to pursue successful futures beyond high school, futures that include additional postsecondary study for most students, and to equip students with a set of core knowledge and skills that enable them to be adaptive learners throughout their lives. Alignment is only a preliminary step in achieving this goal.

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Appendices to
Lining Up: The Relationship between the Common Core State Standards and Five Sets of Comparison Standards

epic

Recall that all raters could match up to three Common Core standards that they judged to be aligned with a comparison standard. The Depth of Knowledge (DOK) Consistency calculation for each Common Core content-specific area uses only raters who had at least one match with a Common Core standard for that content-specific area. (For the purposes of this explanation, we call these "relevant raters." Those are the raters who identified at least one match in a Common Core content-specific area – specifically a strand for English language arts and literacy and a conceptual category in mathematics.)

For each relevant rater, the WAT first calculates the proportion of comparison standards that are under, at, or above the DOK level of the matched Common Core standard. Then, the statistic involves calculating an overall average for each category (under, at, above) across those relevant raters. If the sum of the at and above categories is over 75%, then the criteria for the DOK Consistency is met.

The Common Core standards below were released in June 2010 and may contain minor differences from the current version due to slight edits after original release. Table B1 contains English language arts and literacy standards and Table B2 contains mathematics standards.

Table B1. English Language Arts and Literacy Common Core Standards Content, with Depth of Knowledge Consensus Ratings

Reference standard number[a]	Standard	DOK rating
1	Reading Standards for Literature	3
1.1	*Key Ideas and Details*	*3*
1.1a	1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	3
1.1b	2. Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.	3
1.1c	3. Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).	3
1.2	*Craft and Structure*	*3*
1.2a	4. Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)	3
1.2b	5. Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.	3
1.2c	6. Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).	3
1.3	*Integration of Knowledge and Ideas*	*4*
1.3a	7. Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.)	4
1.3b	9. Demonstrate knowledge of eighteenth-, nineteenth-, and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics.	4
1.4	*Range of Reading and Level of Text Complexity*	*4*
1.4a	10. By the end of grade 11, read and comprehend literature, including stories, dramas, and poems, in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 11–CCR text complexity band independently and proficiently.	4
2	Reading Standards for Informational Texts	3
2.1	*Key Ideas and Details*	*3*
2.1a	1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	3
2.1b	2. Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.	3

[a]The reference standard number refers to the numbering system that was used for the purposes of organizing ratings for this study.

Table B1. continued

Reference standard number[a]	Standard	DOK rating
2.1c	3. Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.	3
2.2	*Craft and Structure*	*3*
2.2a	4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).	3
2.2b	5. Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.	3
2.2c	6. Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.	3
2.3	*Integration of Knowledge and Ideas*	*4*
2.3a	7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	4
2.3b	8. Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).	4
2.3c	9. Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.	4
2.4	*Range of Reading and Level of Text Complexity*	*4*
2.4a	10. By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently.	4
3	Writing Standards	3
3.1	*Text Types and Purposes*	*3*
3.1a	1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.	3
3.1b	a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence.	3
3.1c	b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases.	4
3.1d	c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.	3
3.1e	d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.	3
3.1f	e. Provide a concluding statement or section that follows from and supports the argument presented.	2
3.1g	2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.	3
3.1h	a. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.	3

Table B1. continued

Reference standard number[a]	Standard	DOK rating
3.1i	b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.	3
3.1j	c. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.	3
3.1k	d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.	3
3.1l	e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.	3
3.1m	f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).	2
3.1n	3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.	3
3.1o	a. Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.	3
3.1p	b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.	3
3.1q	c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution).	3
3.1r	d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.	3
3.1s	e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.	3
3.2	*Production and Distribution of Writing*	*3*
3.2a	4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)	3
3.2b	5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (Editing for conventions should demonstrate command of Language standards 1–3, up to and including grades 11–12 on page 54.)	3
3.2c	6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	4
3.3	Research to Build and Present Knowledge	4
3.3a	7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	4
3.3b	8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	4
3.3c	9. Draw evidence from literary or informational texts to support analysis, reflection, and research.	3
3.3d	a. Apply grades 11–12 Reading standards to literature (e.g., "Demonstrate knowledge of eighteenth-, nineteenth-, and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics").	4
3.3e	b. Apply grades 11–12 Reading standards to literary nonfiction (e.g., "Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning [e.g., in U.S. Supreme Court Case majority opinions and dissents] and the premises, purposes, and arguments in works of public advocacy [e.g., The Federalist, presidential addresses]").	4

Table B1. continued

Reference standard number[a]	Standard	DOK rating
3.4	*Range of Writing*	*4*
3.4a	10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.	4
4	Speaking and Listening Standards	3
4.1	*Comprehension and Collaboration*	*3*
4.1a	1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own ideas clearly and persuasively.	3
4.1b	a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.	4
4.1c	b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.	3
4.1d	c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.	3
4.1e	d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.	4
4.1f	2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.	4
4.1g	3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.	3
4.2	*Presentation of Knowledge and Ideas*	*3*
4.2a	4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range or formal and informal tasks.	3
4.2b	5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.	3
4.2c	6. Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 on page 54 for specific expectations.)	3
5	Language Standards	2
5.1	*Conventions of Standard English*	*1*
5.1a	1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.	1
5.1b	a. Apply the understanding that usage is a matter of convention, can change over time, and is sometimes contested.	2
5.1c	b. Resolve issues of complex or contested usage, consulting references (e.g., Merriam-Webster's Dictionary of English Usage, Garner's Modern American Usage) as needed.	2
5.1d	2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.	1
5.1e	a. Observe hyphenation conventions.	1
5.1f	b. Spell correctly.	1
5.2	*Knowledge of Language*	*2*
5.2a	3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.	2

Table B1. continued

Reference standard number[a]	Standard	DOK rating
5.2b	a. Vary syntax for effect, consulting references (e.g., Tufte's Artful Sentences) for guidance as needed; apply an understanding of syntax to the study of complex texts when reading.	2
5.3	*Vocabulary Acquisition and Use*	*2*
5.3a	4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11-12 reading and content, choosing flexibly from a range of strategies.	2
5.3b	a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.	2
5.3c	b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).	1
5.3d	c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage.	1
5.3e	d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).	1
5.3f	5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.	2
5.3g	a. Interpret figures of speech (e.g., hyperbole, paradox) in context and analyze their role in the text.	3
5.3h	b. Analyze nuances in the meaning of words with similar denotations.	2
5.3i	6. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	3
6	Reading Standards for Literacy in History/Social Studies	3
6.1	*Key Ideas and Details*	*3*
6.1a	1. Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.	3
6.1b	2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.	2
6.1c	3. Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.	3
6.2	*Craft and Structure*	*3*
6.2a	4. Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).	2
6.2b	5. Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole.	3
6.2c	6. Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence.	4
6.3	*Integration of Knowledge and Ideas*	*4*
6.3a	7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.	4
6.3b	8. Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information.	4
6.3c	9. Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.	4
6.4	*Range of Reading and Level of Text Complexity*	*3*
6.4a	10. By the end of grade 12, read and comprehend history/social studies texts in the grades 11–12 text complexity band independently and proficiently.	3

Table B1. continued

Reference standard number[a]	Standard	DOK rating
7	Reading Standards for Literacy in Science and Technical Subjects	3
7.1	*Key Ideas and Details*	*3*
7.1a	1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.	3
7.1b	2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	2
7.1c	3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.	3
7.2	*Craft and Structure*	*3*
7.2a	4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.	1
7.2b	5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.	3
7.2c	6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.	3
7.3	*Integration of Knowledge and Ideas*	*4*
7.3a	7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.	4
7.3b	8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying data when possible and corroborating or challenging conclusions with other sources of information.	4
7.3c	9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.	4
7.4	*Range of Reading and Level of Text Complexity*	*3*
7.4a	10. By the end of Grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.	3
8	Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	3
8.1	*Text Types and Purposes*	*3*
8.1a	1. Write arguments focused on discipline-specific content.	3
8.1b	a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.	3
8.1c	b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.	4
8.1d	c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.	3
8.1e	d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.	3
8.1f	e. Provide a concluding statement or section that follows from or supports the argument presented.	2
8.1g	2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.	3
8.1h	a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.	3

Table B1. continued

Reference standard number[a]	Standard	DOK rating
8.1i	b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.	3
8.1j	c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.	3
8.1k	d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.	3
8.1l	e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).	3
8.2	*Production and Distribution of Writing*	*3*
8.2a	4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	3
8.2b	5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	3
8.2c	6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	4
8.3	*Research to Build and Present Knowledge*	*4*
8.3a	7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	4
8.3b	8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	4
8.3c	9. Draw evidence from informational texts to support analysis, reflection, and research.	3
8.4	*Range of Writing*	*4*
8.4a	10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	4

[a]The reference standard number refers to the numbering system that was used for the purposes of organizing ratings for this study.

Table B2. Mathematics Common Core Standards Content, with Depth of Knowledge (DOK) Consensus Ratings

Reference standard number[a]	Standard	DOK rating
1	Number and Quantity	1
	The Real Number System	
1.1	*Extend the properties of exponents to rational exponents.*	*2*
1.1a	1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define* $5^{1/3}$ *to be the cube root of 5 because we want* $(5^{1/3})^3 = 5^{(1/3)^3}$ *to hold, so* $(5^{1/3})^3$ *must equal 5.*	2
1.1b	2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	1
1.2	*Use properties of rational and irrational numbers.*	*3*
1.2a	3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	3
	Quantities	
1.3	*Reason quantitatively and use units to solve problems.*	*2*
1.3a	1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	2
1.3b	2. Define appropriate quantities for the purpose of descriptive modeling.	2
1.3c	3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	2
	The Complex Number System	
1.4	*Perform arithmetic operations with complex numbers.*	*1*
1.4a	1. Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b being real.	1
1.4b	2. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	1
1.4c	3. (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	2
1.5	Represent complex numbers and their operations on the complex plane.	2
1.5a	4. (+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	2
1.5b	5. (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. *For example,* $(1 - \sqrt{3}i)^3 = 8$ *because* $(1 - \sqrt{3}i)$ *has modulus* 2 *and argument* 120°.	2
1.5c	6. (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	1
1.6	*Use complex numbers in polynomial identities and equations.*	*2*
1.6a	7. Solve quadratic equations with real coefficients that have complex solutions.	1
1.6b	8. (+) Extend polynomial identities to the complex numbers. *For example, rewrite* $x^2 + 4$ *as* $(x + 2i)(x - 2i)$.	2
1.6c	9. (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	2

[a]The reference standard number refers to the numbering system that was used for the purposes of organizing ratings for this study.

(+) is an indication in the Common Core mathematics standards document to show that some mathematics standards represent advanced content and are intended to prepare students for advanced courses (see Chapter 2 for description).

★is an indication in the Common Core mathematics standards document to show a modeling standard (see Chapter 2 for description).

Table B2. continued

Reference standard number[a]	Standard	DOK rating
	Vector and Matrix Quantities	
1.7	*Represent and model with vector quantities.*	*1*
1.7a	1. (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., **v**, $\|\boldsymbol{v}\|$, $\|\|\boldsymbol{v}\|\|$, $\boldsymbol{v}$).	1
1.7b	2. (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.	1
1.7c	3. (+) Solve problems involving velocity and other quantities that can be represented by vectors.	2
1.8	*Perform operations on vectors.*	*1*
1.8a	4. (+) Add and subtract vectors.	1
1.8b	a. Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.	1
1.8c	b. Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.	2
1.8d	c. Understand vector subtraction $\boldsymbol{v} - \boldsymbol{w}$ as $\boldsymbol{v} + (-\boldsymbol{w})$, where $-\boldsymbol{w}$ is the additive inverse of $\boldsymbol{w}$, with the same magnitude as $\boldsymbol{w}$ and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	2
1.8e	5. (+) Multiply a vector by a scalar.	1
1.8f	a. Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$.	1
1.8g	b. Compute the magnitude of a scalar multiple $c\boldsymbol{v}$ using $\|\|c\boldsymbol{v}\|\| = \|c\|v$. Compute the direction of cv knowing that when $\|c\|v \neq 0$, the direction of $c\boldsymbol{v}$ is either along $\boldsymbol{v}$ (for $c > 0$) or against **v** (for $c < 0$).	1
1.9	*Perform operations on matrices and use matrices in applications.*	*1*
1.9a	6. (+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.	2
1.9b	7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.	1
1.9c	8. (+) Add, subtract, and multiply matrices of appropriate dimensions.	1
1.9d	9. (+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.	1
1.9e	10. (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	1
1.9f	11. (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.	1
1.9g	12. (+) Work with 2 × 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.	2
2	Algebra	2
	Seeing Structure in Expressions	
2.1	*Interpret the structure of expressions*	*2*
2.1a	1. Interpret expressions that represent a quantity in terms of its context.★	2
2.1b	a. Interpret parts of an expression, such as terms, factors, and coefficients.	1
2.1c	b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret* $P(1+r)^n$ *as the product of P and a factor not depending on P.*	2

Table B2. continued

Reference standard number[a]	Standard	DOK rating
2.1d	2. Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*	2
2.2	*Write expressions in equivalent forms to solve problems*	*2*
2.2a	3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	2
2.2b	a. Factor a quadratic expression to reveal the zeros of the function it defines.	2
2.2c	b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	2
2.2d	c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	2
2.2e	4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.*	2
	Arithmetic with Polynomials and Rational Functions	
2.3	*Perform arithmetic operations on polynomials*	*1*
2.3a	1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	1
2.4	*Understand the relationship between zeros and factors of polynomials*	*2*
2.4a	2. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is p(a), so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	2
2.4b	3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	2
2.5	*Use polynomial identities to solve problems*	*3*
2.5a	4. Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.*	3
2.5b	5. (+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle. (The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.)	1
2.6	*Rewrite rational expressions*	*2*
2.6a	6. Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	2
2.6b	7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	2
	Creating Equations	
2.7	*Create equations that describe numbers or relationships*	*3*
2.7a	1. Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*	3
2.7b	2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	3
2.7c	3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	3
2.7d	4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law $V = IR$ to highlight resistance R.*	1

Table B2. continued

Reference standard number[a]	Standard	DOK rating
	Reasoning with Equations and Inequalities	
2.8	*Understand solving equations as a process of reasoning and explain the reasoning*	*3*
2.8a	1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	3
2.8b	2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	2
2.9	*Solve equations and inequalities in one variable*	*2*
2.9a	3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	1
2.9b	4. Solve quadratic equations in one variable.	1
2.9c	a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	2
2.9d	b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	2
2.10	*Solve systems of equations*	*2*
2.10a	5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	3
2.10b	6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	2
2.10c	7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. *For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.*	2
2.10d	8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.	1
2.10e	9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	2
2.11	*Represent and solve equations and inequalities graphically*	*2*
2.11a	10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	1
2.11b	11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★	2
2.11c	12. Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	2
3	Functions	2
	Interpreting Functions	
3.1	*Understand the concept of a function and use function notation*	*1*
3.1a	1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.	1

Table B2. continued

Reference standard number[a]	Standard	DOK rating
3.1b	2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	2
3.1c	3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.*	1
3.2	*Interpret functions that arise in applications in terms of the context*	*2*
3.2a	4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*★	2
3.2b	5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*★	2
3.2c	6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★	2
3.3	*Analyze functions using different representations*	*2*
3.3a	7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★	2
3.3b	a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	1
3.3c	b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	2
3.3d	c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	2
3.3e	d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.	2
3.3f	e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	2
3.3g	8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	2
3.3h	a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	2
3.3i	b. Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.*	2
3.3j	9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	2
	Building Functions	
3.4	*Build a function that models a relationship between two quantities*	*3*
3.4a	1. Write a function that describes a relationship between two quantities.★	3
3.4b	a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	3
3.4c	b. Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*	3

Table B2. continued

Reference standard number[a]	Standard	DOK rating
3.4d	c. (+) Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.*	3
3.4e	2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★	3
3.5	*Build new functions from existing functions*	*2*
3.5a	3. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*	3
3.5b	4. Find inverse functions.	2
3.5c	a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. *For example,* $f(x) = 2x^3$ *for* $x > 0$ *or* $f(x) = (x+1)/(x-1)$ *for* $x \neq 1$.	2
3.5d	b. (+) Verify by composition that one function is the inverse of another.	1
3.5e	c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.	1
3.5f	d. (+) Produce an invertible function from a non-invertible function by restricting the domain.	2
3.5g	5. (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	2
	Linear and Exponential Models	
3.6	*Construct and compare linear and exponential models and solve problems*	*2*
3.6a	1. Distinguish between situations that can be modeled with linear functions and with exponential functions.	2
3.6b	a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	3
3.6c	b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	1
3.6d	c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	1
3.6e	2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	2
3.6f	3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	2
3.6g	4. For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	2
3.7	*Interpret expressions for functions in terms of the situation they model*	*2*
3.7a	5. Interpret the parameters in a linear or exponential function in terms of a context.	2
	Trigonometric Functions	
3.8	*Extend the domain of trigonometric functions using the unit circle*	*3*
3.8a	1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	1
3.8b	2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	3

Table B2. continued

Reference standard number[a]	Standard	DOK rating
3.8c	3. (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for π/3, π/4 and p/6, and use the unit circle to express the values of sine, cosine, and tangent for *x*, *π+x*, and *2π–x* in terms of their values for *x*, where *x* is any real number.	2
3.8d	4. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	3
3.9	*Model periodic phenomena with trigonometric functions*	*2*
3.9a	5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.★	2
3.9b	6. (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.	1
3.9c	7. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.★	2
3.10	*Prove and apply trigonometric identities*	*4*
3.10a	8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.	3
3.10b	9. (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	4
4	Geometry	3
	Congruence	
4.1	*Experiment with transformations in the plane*	*2*
4.1a	1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	1
4.1b	2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	2
4.1c	3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	2
4.1d	4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	2
4.1e	5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	3
4.2	*Understand congruence in terms of rigid motions*	*3*
4.2a	6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	2
4.2b	7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	3
4.2c	8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	3
4.3	*Prove geometric theorems*	*4*
4.3a	9. Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; and points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*	4

Table B2. continued

Reference standard number[a]	Standard	DOK rating
4.3b	10. Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; and the medians of a triangle meet at a point.*	4
4.3c	11. Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.*	4
4.4	*Make geometric constructions*	*3*
4.4a	12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Examples include: copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*	3
4.4b	13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	3
	Similarity, Right Triangles, and Trigonometry	
4.5	*Understand similarity in terms of similarity transformations*	*2*
4.5a	1. Verify experimentally the properties of dilations given by a center and a scale factor:	3
4.5b	a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.	1
4.5c	b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	1
4.5d	2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	3
4.5e	3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	2
4.6	*Prove theorems involving similarity*	*4*
4.6a	4. Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*	4
4.6b	5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	4
4.7	*Define trigonometric ratios and solve problems involving right triangles*	*2*
4.7a	6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	1
4.7b	7. Explain and use the relationship between the sine and cosine of complementary angles.	2
4.7c	8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	2
4.8	*Apply trigonometry to general triangles*	*3*
4.8a	9. (+) Derive the formula $A = 1/2\ ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	3
4.8b	10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.	4
4.8c	11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	3
	Circles	
4.9	*Understand and apply theorems about circles*	*3*
4.9a	1. Prove that all circles are similar.	3

Table B2. continued

Reference standard number[a]	Standard	DOK rating
4.9b	2. Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; and the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*	3
4.9c	3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	3
4.9d	4. (+) Construct a tangent line from a point outside a given circle to the circle.	2
4.10	*Find arc lengths and areas of sectors of circles*	*3*
4.10a	5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	3
	Expressing Geometric Properties with Equations	
4.11	*Translate between the geometric description and the equation for a conic section*	*2*
4.11a	1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	2
4.11b	2. Derive the equation of a parabola given a focus and directrix.	2
4.11c	3. (+) Derive the equations of ellipses and hyperbolas given foci and directrices.	2
4.12	*Use coordinates to prove simple geometric theorems algebraically*	*3*
4.12a	4. Use coordinates to prove simple geometric theorems algebraically. *For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).*	3
4.12b	5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	3
4.12c	6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	2
4.12d	7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★	2
	Geometric Measurement and Dimension	
4.13	*Explain volume formulas and use them to solve problems*	*3*
4.13a	1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*	3
4.13b	2. (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	3
4.13c	3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★	2
4.14	*Visualize relationships between two-dimensional and three-dimensional objects*	*2*
4.14a	4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	2
	Modeling with Geometry	
4.15	*Apply geometric concepts in modeling situations*	*2*
4.15a	1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).★	2
4.15b	2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).★	2
4.15c	3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).★	4

Table B2. continued

Reference standard number[a]	Standard	DOK rating
5	Statistics and Probability★	2
	Interpreting Categorical and Quantitative Data	
5.1	*Summarize, represent, and interpret data on a single count or measurement variable*	*2*
5.1a	1. Represent data with plots on the real number line (dot plots, histograms, and box plots).★	1
5.1b	2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.★	2
5.1c	3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).★	2
5.1d	4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.★	2
5.2	*Summarize, represent, and interpret data on two categorical and quantitative variables*	*2*
5.2a	5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.★	2
5.2b	6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★	2
5.2c	a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	2
5.2d	b. Informally assess the fit of a function by plotting and analyzing residuals.	3
5.2e	c. Fit a linear function for a scatter plot that suggests a linear association.	1
5.3	*Interpret linear models*	*2*
5.3a	7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.★	2
5.3b	8. Compute (using technology) and interpret the correlation coefficient of a linear fit.★	2
5.3c	9. Distinguish between correlation and causation.★	2
	Making Inferences and Justifying Conclusions	
5.4	*Understand and evaluate random processes underlying statistical experiments*	*3*
5.4a	1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.★	1
5.4b	2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*★	3
5.5	*Make inferences and justify conclusions from sample surveys, experiments, and observational studies*	*3*
5.5a	3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.★	2
5.5b	4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.★	2
5.5c	5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.★	3
5.5d	6. Evaluate reports based on data.★	3

Table B2. continued

Reference standard number[a]	Standard	DOK rating
	Conditional Probability and the Rules of Probability	
5.6	*Understand independence and conditional probability and use them to interpret data*	*2*
5.6a	1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").★	2
5.6b	2. Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent.★	2
5.6c	3. Understand the conditional probability of *A* given *B* as *P(A* and *B)/P(B)*, and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*.★	2
5.6d	4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among mathematics, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*★	2
5.6e	5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. *For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*★	2
5.7	*Use the rules of probability to compute probabilities of compound events in a uniform probability model*	*2*
5.7a	6. Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A*, and interpret the answer in terms of the model.★	2
5.7b	7. Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.★	2
5.7c	8. (+) Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B) P(A|B), and interpret the answer in terms of the model.★	2
5.7d	9. (+) Use permutations and combinations to compute probabilities of compound events and solve problems.★	2
	Using Probability to Make Decisions	
5.8	*Calculate expected values and use them to solve problems*	*2*
5.8a	1. (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.★	2
5.8b	2. (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.★	2
5.8c	3. (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. *For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.*★	2
5.8d	4. (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. *For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?*★	2
5.9	*Use probability to evaluate outcomes of decisions*	*2*
5.9a	5. (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.★	2

Table B2. continued

Reference standard number[a]	Standard	DOK
5.9b	a. Find the expected payoff for a game of chance. *For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant.*	2
5.9c	b. Evaluate and compare strategies on the basis of expected values. *For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.*	2
5.9d	6. (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).★	2
5.9e	7. (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).★	4

[a]The reference standard number refers to the numbering system that was used for the purposes of organizing ratings for this study.

(+) is an indication in the Common Core mathematics standards document to show that some mathematics standards represent advanced content and are intended to prepare students for advanced courses (see Chapter 2 for description).

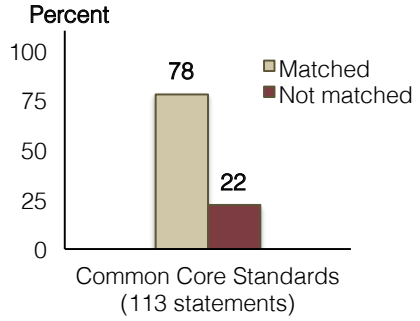
★ is an indication in the Common Core mathematics standards document to show a modeling standard (see Chapter 2 for description).

In the sections that follow, we present the alignment findings between each set of individual comparison standards and the Common Core standards. These include (1) the state standards for California; (2) the state standards for Massachusetts; (3) the Texas Career and College Readiness Standards; (4) the Knowledge and Skills for University Success; and 5) the International Baccalaureate Diploma Programme standards. Chapters 3 and 4 presented basic findings. The text in this appendix summarizes additional findings and the Technical Supplement contains even more detailed information on the statistics and raw data.

California Standards

The 11th–12th-grade English language arts standards and the 8th–12th-grade standards in mathematics of the California Content Standards were compared to the Common Core standards.

Figure C1. Percentage of Common Core Standards that Match California Standards for ELA and Literacy



English Language Arts and Literacy Findings for the California Standards

Match

Recall that raters identified up to three Common Core standards as matching each California standard. Figure C1 shows the percent of Common Core statements (n = 113) that any of the nine ELA raters matched to one or more of the California standards (n = 108). The figure collapses findings across all eight English language arts (ELA) and literacy strands. In Figure C2, we divide findings by strand. As the bar graphs indicate, the California standards have matches for 100% of the Common Core standards in three strands, Reading for Literature, Reading for Informational Text, and Reading Standards in History/Social Studies. The California standards have matches to 76-89% of the Common Core standards in the Writing, Speaking and Listening, and Language strands. They have matches to 40% of the Common Core standards in the Reading Standards in Science and Technical Subjects strand and 47% in the Writing Standards in History/Social Studies, Science, and Technical Subjects strand. The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 3 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each strand. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Every strand meets the criterion for the Categorical Concurrence statistic, which specifies that, across raters, an average of one correspondence in a content area is sufficient.

Figure C2. Percentage of Common Core Standards that Match California Standards for ELA and Literacy Strand

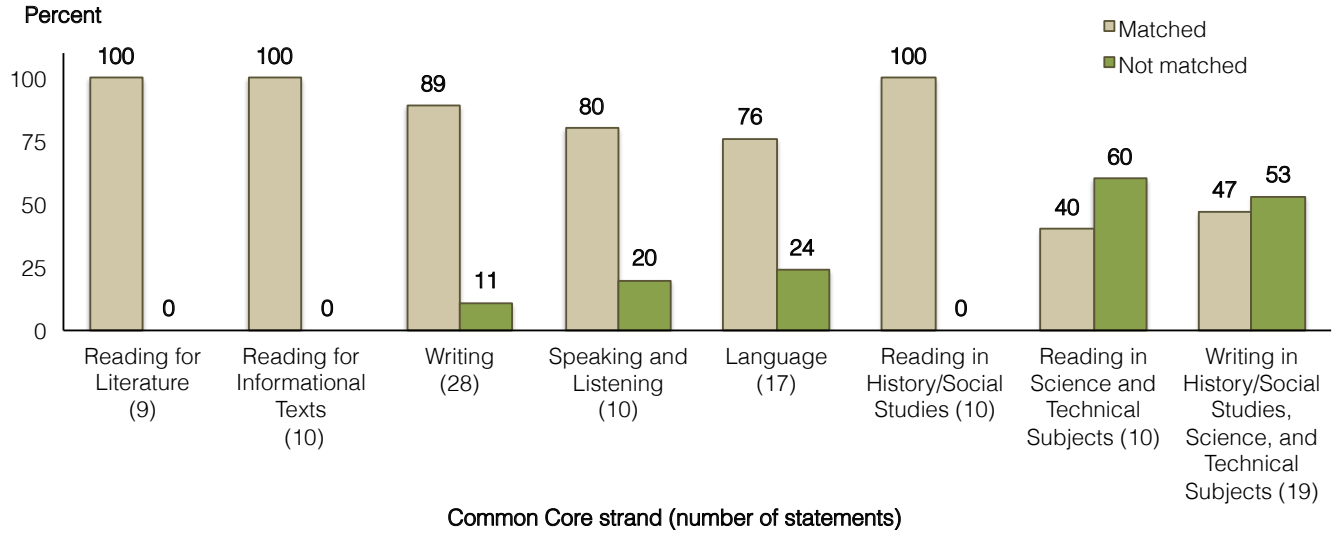


Table C1. Summary for Alignment Between the California Standards and Common Core Standards for English Language Arts and Literacy

Common Core ELA and literacy strand	Categorical Concurrence	Coverage
Reading for Literature		
Reading for Informational Texts		
Writing		
Speaking and Listening		
Language		
Reading in History/Social Studies		
Reading in Science and Technical Subjects		
Writing in History/Social Studies, Science, and Technical Subjects		

Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
Does not meet the criterion for Categorical Concurrence;
means that a majority of topics in the Common Core category have at least one matched comparison standard;
means that in more than one topic in the Common Core category have at least one matched comparison standard;
means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

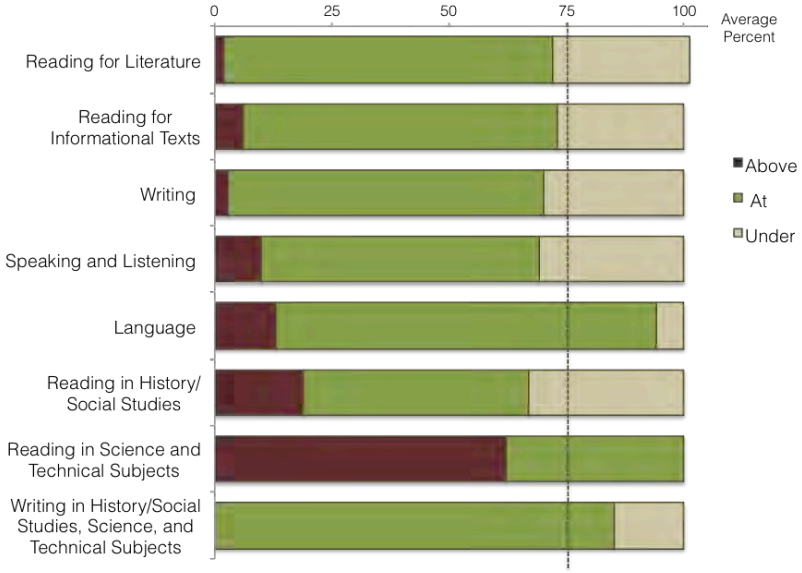
Breadth of Coverage

Breadth of Coverage is strong for all the ELA and literacy strands (the majority of Common Core topics have matching comparison standards within them). This means that the California standards that match to Common Core standards are distributed across content topics within each Common Core strand. Table C1 presents the alignment summary for the Webb and Cook alignment statistics (Cook, 2005; Cook & Wilmes, 2007; Webb, 2002a).

Depth of Knowledge

Across all matched standards for ELA and literacy, an average of 66% (*SD* = 43) of California standards are at the same Depth of Knowledge (DOK) level as the Common Core standards, with an average of 26% (*SD* = 40) of the California standards rated lower in cognitive demand and an average of 8% (*SD* = 24) rated higher. Three of the eight strands (shown in Figure C3) meet the DOK Consistency criterion, which is based on at least 75% of the matching comparison standards being at or above the DOK of the corresponding Common Core standard. As Figure C3 shows, some strands fall close to 75% and results would be different if an alternative criterion had been selected.

Figure C3. California Standards Depth of Knowledge Levels Under, At, and Above the Common Core for ELA and Literacy



Note: Total percent may equal slightly above or below 100 due to rounding.

Mathematics Findings for the California Standards

Match

Figure C4 shows the percent of Common Core statements (n = 192) that any of the seven mathematics raters matched to one or more of the California standards (n = 185). The figure collapses findings across the five conceptual categories. In Figure C5, we divide findings by conceptual category. As the bar graphs indicate, a high percent of the Common Core standards match California standards in each conceptual category (ranging from 82–91%). Again, the data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 4 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each conceptual category. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched. Every conceptual category meets the criterion for the Categorical Concurrence statistic.

Figure C4. Percentage of Common Core Standards that Match California Standards, for Mathematics

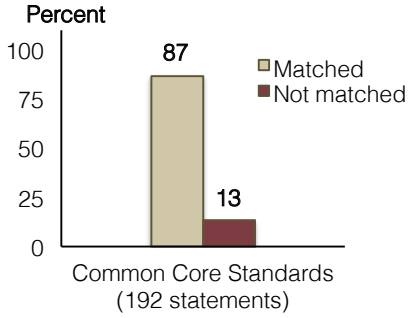


Figure C5. Percentage of Common Core Standards that Match California Standards, by Mathematics Conceptual Category

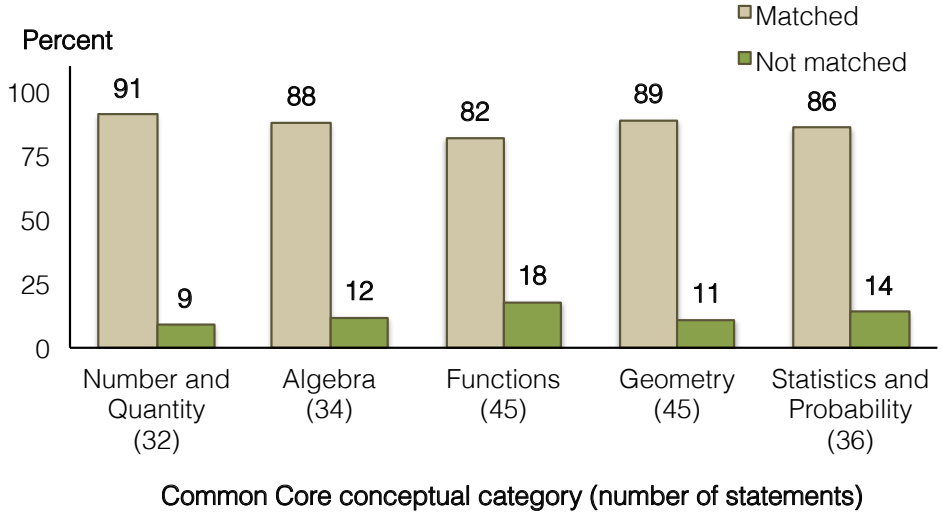


Table C2. Summary for Alignment Between the California Standards and Common Core Standards for Mathematics

Common Core mathematics conceptual category	Categorical Concurrence	Coverage
Number and Quantity		
Algebra		
Functions		
Geometry		
Statistics and Probability		

Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
Does not meet the criterion for Categorical Concurrence;
means that a majority of topics in the Common Core category have at least one matched comparison standard;
means that in more than one topic in the Common Core category have at least one matched comparison standard;
means that Common Core standards in one or less than one topic in the strand have at least one matched comparison standard.

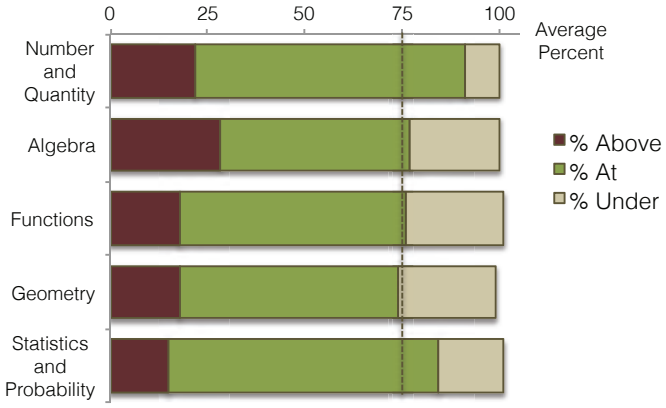
Breadth of Coverage

Breadth of Coverage is strong for all the mathematics conceptual categories (the majority of Common Core clusters have matching comparison standards within them). Table C2 presents the summarized alignment results for mathematics.

Depth of Knowledge

For California mathematics standards that match to Common Core standards, an average of 59% (*SD* = 46) fall at the same level as the Common Core standards with an average of 21% (*SD* = 39) lower in cognitive demand and 20% (*SD* = 38) higher in cognitive demand. Four of the five Common Core conceptual categories (shown in Figure C6) meet the DOK Consistency criterion, with Geometry being the one category that does not meet the criterion. As Figure C6 shows, some categories fall close to 75% and results would be different if an alternative criterion had been selected.

Figure C6. Percentage of California Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for Mathematics



Note: Total percent may equal slightly above or below 100 due to rounding.

Massachusetts Standards

The study compared the 11th–12th-grade standards from the Massachusetts Curriculum Frameworks to the Common Core standards.

English Language Arts and Literacy Findings for the Massachusetts Standards

Match

Recall that raters identified up to three Common Core standards that correspond with each Massachusetts standard. Figure C7 shows the percent of Common Core statements (*n* = 113) that any of the nine ELA raters matched to one or more of the Massachusetts standards (*n* = 41). The figure collapses findings across all eight English language arts (ELA) and literacy strands. In Figure C8, we divide findings by strand. As the bar graphs indicate, the Massachusetts standards have matches for 100% of the Common Core standards in Reading for Literature, and Speaking and Listening. The Massachusetts standards have matches to 71–94% of the Common Core standards in the Reading for Informational Text, Writing, and Language strands. For the Reading Standards in History/Social Studies strand, Reading Standards in Science and Technical Subjects strand, and Writing Standards in History/Social Studies, Science, and Technical Subjects strand, the Massachusetts standards have matches to 20–40% of the Common Core standards.[1] Six of eight strands meet the criterion for the Categorical Concurrence statistic, which specifies that, across raters, an average of one correspondence in a content area is sufficient. The two Reading for Literacy (in History/Social Studies and in Science and Technical Subjects) do not meet the criterion.

[1]The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 3 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each strand. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Figure C7. Percentage of Common Core Standards that Match Massachusetts Standards, for ELA and Literacy

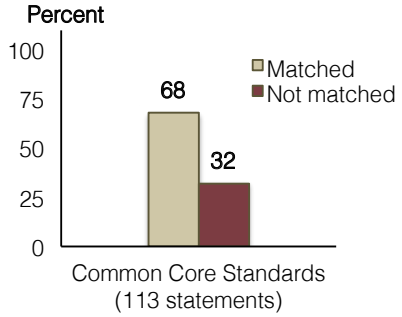


Figure C8. Percentage of Common Core Standards that Match Massachusetts Standards, by ELA and Literacy Strand

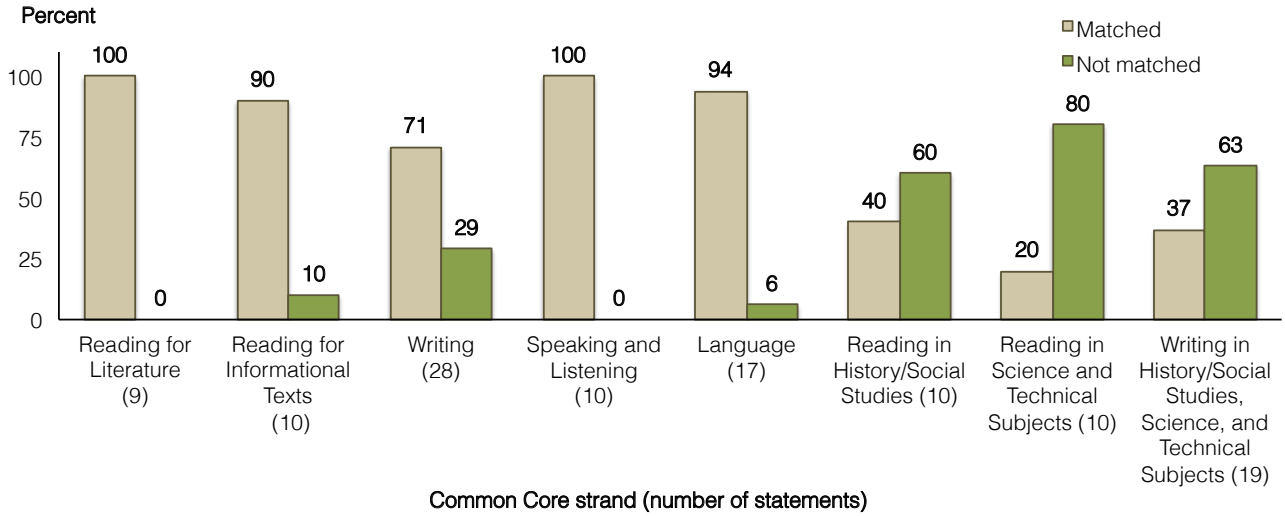


Table C3. Summary for Alignment Between the Massachusetts Standards and the Common Core Standards for English Language Arts and Literacy

Common Core ELA and literacy strand	Categorical Concurrence	Coverage
Reading for Literature	●	●
Reading for Informational Texts	●	●
Writing	●	●
Speaking and Listening	●	●
Language	●	●
Reading in History/Social Studies	●	●
Reading in Science and Technical Subjects	●	◐
Writing in History/Social Studies, Science, and Technical Subjects	●	●

● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
● Does not meet the criterion for Categorical Concurrence;
● means that a majority of topics in the Common Core category have at least one matched comparison standard;
◐ means that in more than one topic in the Common Core category have at least one matched comparison standard;
○ means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

Breadth of Coverage

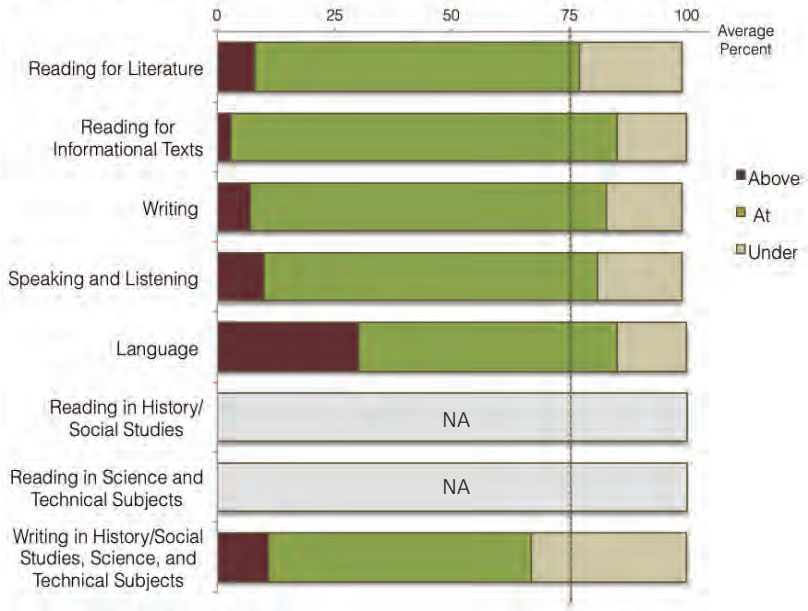
Breadth of Coverage is strong for seven strands (for these, the majority of Common Core topics have matching comparison standards within them). The Reading Standards in History/Social Studies strand is moderate in terms of coverage. This means that Common Core standards match to Massachusetts standards in more than one topic but not a majority of topics within the strand. A summary table (Table C3) presents the ELA and literacy alignment results for the Webb and Cook alignment statistics (Cook, 2005; Cook & Wilmes, 2007; Webb, 2002a).

Depth of Knowledge

Across all matched standards for ELA and literacy, an average of 69% (*SD* = 45) of Massachusetts standards are at the same Depth of Knowledge (DOK) level as the Common Core standards. According to study ratings, an average of 18% (*SD* = 38) are less cognitively demanding and an average of 13% (*SD* = 32) are more cognitively demanding.

Of the six strands meeting the Categorical Concurrence criterion, five meet the DOK Consistency criterion, which is based on at least 75% of the matching Massachusetts standards being at or above the DOK of the corresponding Common Core standard (see Figure C9). One strand did not meet the criterion: Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects. As Figure C9 shows, some strands fall close to 75% and results would be different if an alternative criterion had been selected.

Figure C9. Percentage of Massachusetts Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for ELA and Literacy



Note: Total percent may equal slightly above or below 100 due to rounding.

Mathematics Findings for the Massachusetts Standards

Match

Figure C10 shows the percent of Common Core statements (*n* = 192) that have matches in the Massachusetts standards (*n* = 108). The figure collapses findings across the five conceptual categories. In Figure C11, we divide findings by conceptual category. As the bar graphs indicate, a high percent of the Common Core standards cover the Massachusetts standards in each conceptual category (ranging from 72–100%).[2] Every conceptual category meets the criterion for the Categorical Concurrence statistic.

[2]The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 4 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each conceptual category. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Figure C10. Percentage of Common Core Standards that Match Massachusetts Standards, for Mathematics

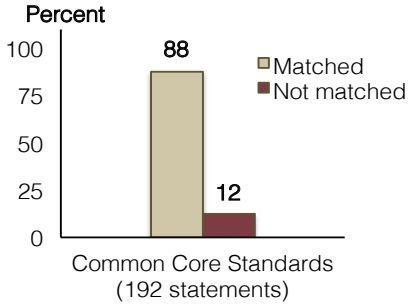


Figure C11. Percentage of Common Core Standards that Match Massachusetts Standards, by Mathematics Conceptual Category

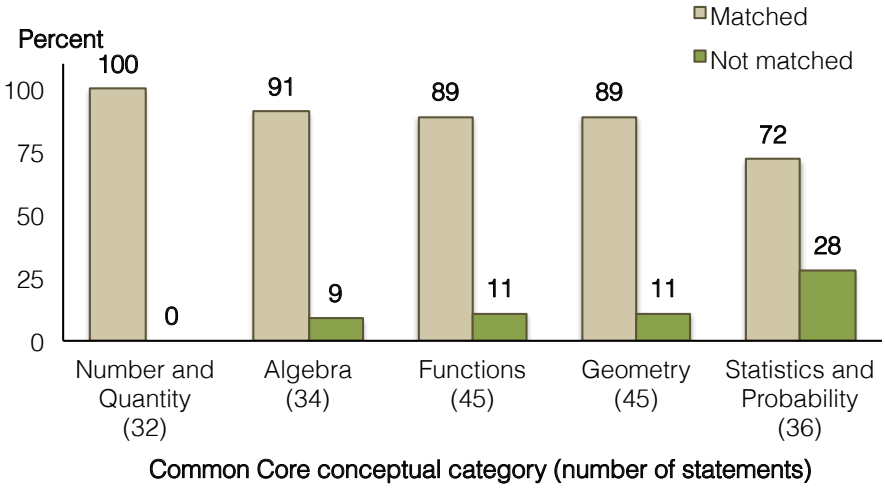


Table C4. Summary for Alignment Between the Massachusetts Standards and Common Core Standards in Mathematics

Common Core mathematics conceptual category	Categorical Concurrence	Coverage
Number and Quantity	●	●
Algebra	●	●
Functions	●	●
Geometry	●	●
Statistics and Probability	●	●

● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
● Does not meet the criterion for Categorical Concurrence;
● means that a majority of topics in the Common Core category have at least one matched comparison standard;
● means that in more than one topic in the Common Core category have at least one matched comparison standard;
○ means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

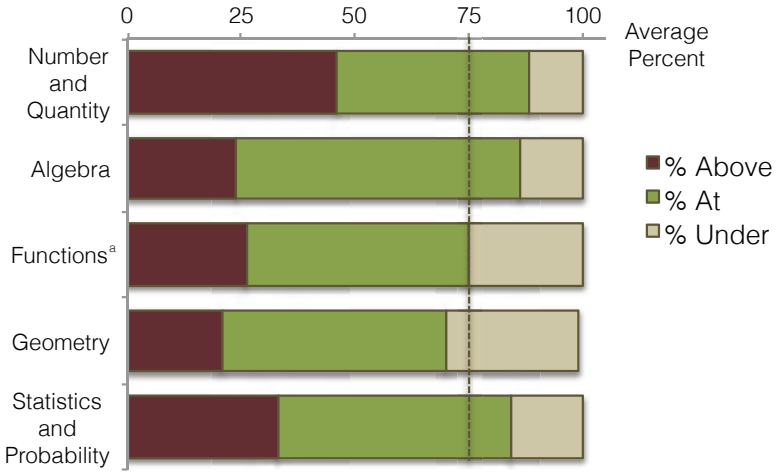
Breadth of Coverage

Breadth of Coverage is strong for all the mathematics conceptual categories (the majority of Common Core clusters have matching comparison standards within them). Table C4 presents the summarized alignment results for mathematics.

Depth of Knowledge

For the Massachusetts standards that match to Common Core standards, an average of 51% (*SD* = 47) fall at the same level of cognitive demand as the Common Core standards. An average of 20% (*SD* = 38) of the Massachusetts standards are lower in cognitive demand than the Common Core standards, and an average of 28% (*SD* = 43) are rated above the Common Core standards. Four of the five Common Core conceptual categories meet the DOK Consistency criterion (see Figure C12). According to ratings, the Geometry category did not meet the criterion. As Figure C12 shows, some categories fall close to or at 75% and results would be different if an alternative criterion had been selected.

Figure C12. Percentage of Massachusetts Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for Mathematics



Note: Total percent may equal slightly above or below 100 due to rounding.
[a]The Functions conceptual category meets the DOK criterion, but due to rounding, the value appears at exactly 75%.

Texas College and Career Readiness Standards

The study compared the English language arts, mathematics, and cross-disciplinary standards from the Texas College and Career Readiness Standards (TCCRS) to the Common Core standards.

English Language Arts Findings for the TCCRS Standards

Match

Raters identified up to three Common Core standards with each TCCRS standard. Figure C13 shows the percent of Common Core statements (n = 113) that any of the nine ELA raters matched to one or more of the TCCRS standards (n = 89). The figure collapses findings across all eight English language arts (ELA) and literacy strands. In Figure C14, we divide findings by strand. As the bar graphs indicate, in five strands the TCCRS standards have matches to 100% of the Common Core standards. Two additional strands have matches to 88–90% of the Common Core standards (Language and Reading Standards in History/Social Studies). The TCCRS standards have matches to 68% of the Common Core standards in the Writing Standards in History/Social Studies, Science, and Technical Subjects strand.[3] Every strand meets the criterion for the Categorical Concurrence statistic, which specifies that, across raters, an average of one correspondence in a content area is sufficient.

[3]The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 3 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each strand. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Figure C13. Percentage of Common Core Standards that Match Texas College and Career Readiness Standards, for ELA and Literacy

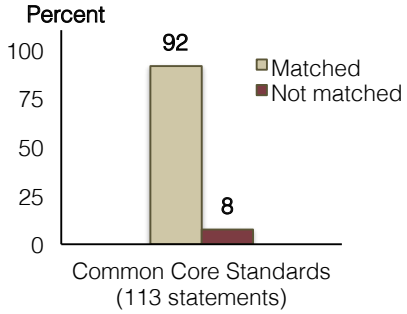


Figure C14. Percentage of Common Core Standards that Match Texas College and Career Readiness Standards, by ELA and Literacy Strand

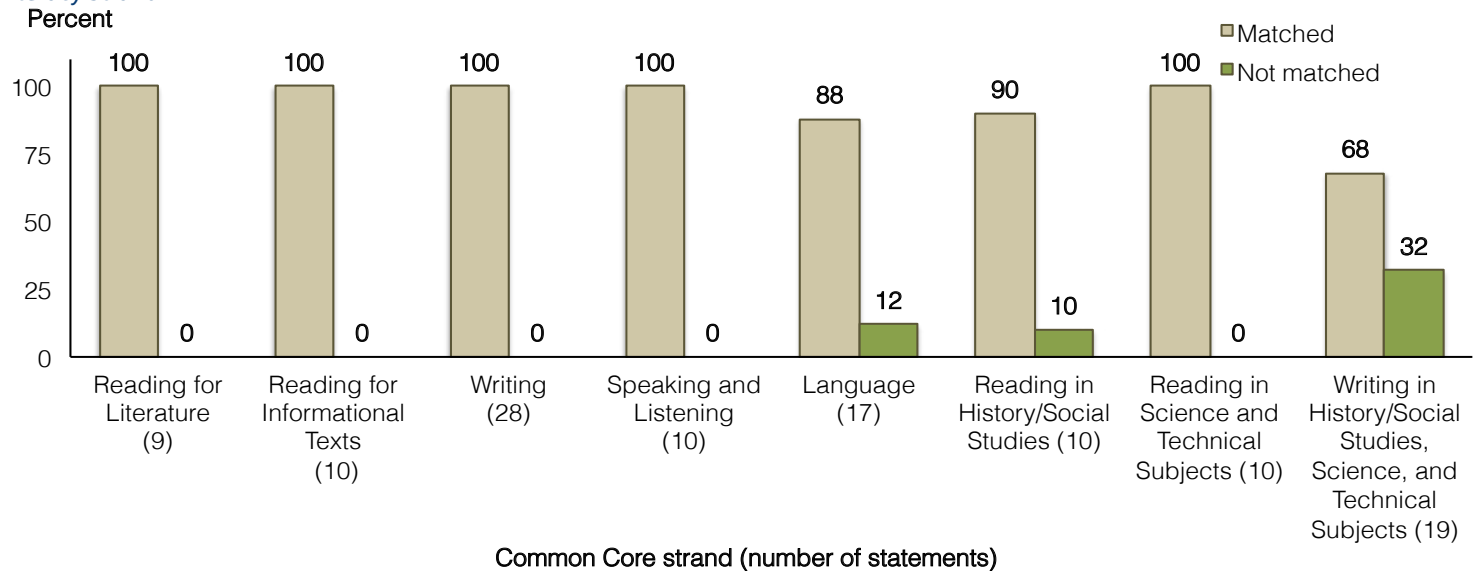


Table C5. Summary of Alignment Between the Texas College and Career Readiness Standards and Common Core for English Language Arts and Literacy

Common Core ELA and literacy strand	Categorical Concurrence	Coverage
Reading for Literature	●	◐
Reading for Informational Texts	●	◐
Writing	●	◐
Speaking and Listening	●	◐
Language	●	◐
Reading in History/Social Studies	●	◐
Reading in Science and Technical Subjects	●	◐
Writing in History/Social Studies, Science, and Technical Subjects	●	◐

● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
● Does not meet the criterion for Categorical Concurrence;
◐ means that in a majority of topics in the Common Core category have at least one matched comparison standard;
◔ means that in more than one topic in the Common Core category have at least one matched comparison standard;
○ means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

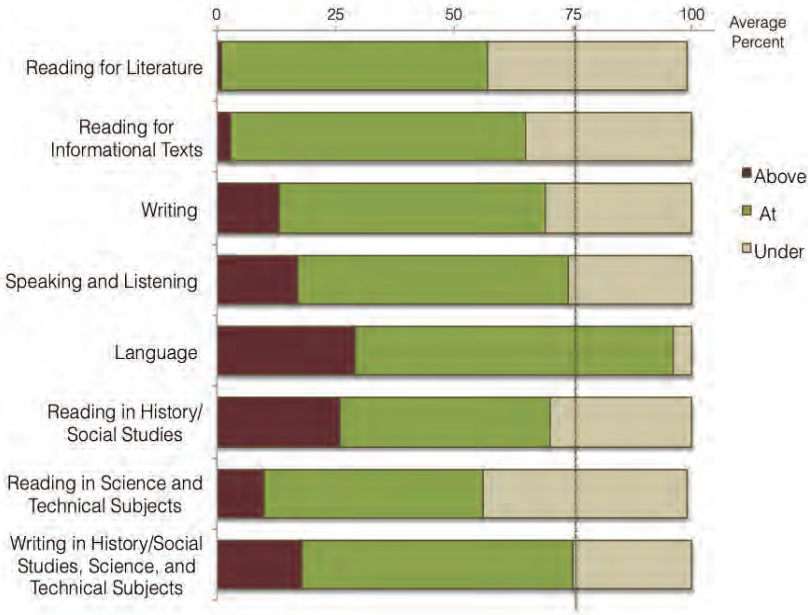
Breadth of Coverage

Breadth of Coverage is rated as strong for all ELA and literacy strands (the majority of Common Core topics have matching comparison standards within them). This means that the Massachusetts standards that match to Common Core standards are distributed across content topics within each Common Core strand. Table C5 presents the alignment summary for the Webb and Cook statistics (Cook, 2005; Cook & Wilmes, 2007; Webb, 2002a).

Depth of Knowledge

Across all matched standards for ELA and literacy, an average of 57% (*SD* = 46) are at the same level as the Common Core standards. According to ratings, an average of 29% (*SD* = 43) of the standards are lower, and 14% (*SD* = 33) are higher in cognitive demand. The Depth of Knowledge (DOK) Consistency criterion is met for two of eight strands: the Language Standards and the Writing Standards in History/Social Studies, Science, and Technical Subjects. For the other six Common Core strands, the criterion is not met. Figure C15 displays the results graphically. As the figure shows, some strands fall close to 75% and results would be different if an alternative criterion had been selected.

Figure C15. Percent of Texas College and Career Readiness Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for ELA and Literacy



Note: Total percent may equal slightly above or below 100 due to rounding.

Mathematics Findings for the TCCRS Standards

Match

Figure C16 shows the percent of Common Core statements (n = 192) that have matches in the TCCRS mathematics standards (n = 115). The figure collapses findings across the five conceptual categories. In Figure C17, we divide findings by conceptual category. As the bar graphs indicate, the TCCRS standards have matches to a high percent (ranging from 76–94%) of the Common Core standards in four of five conceptual categories. For Number and Quantity, the TCCRS standards have matches to only 34% of the Common Core standards.[4] Every conceptual category meets the criterion for the Categorical Concurrence statistic.

[4]The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 4 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each conceptual category. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Figure C16. Percentage of Common Core Standards that Match Texas College and Career Readiness Standards, for Mathematics

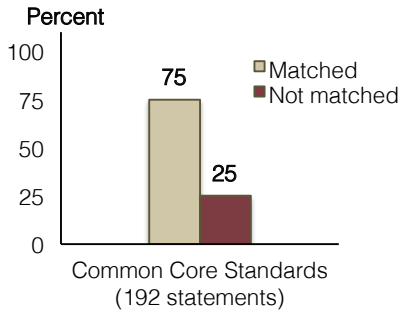


Figure C17. Percentage of Common Core Standards that Match Texas College and Career Readiness Standards, by Mathematics Conceptual Category

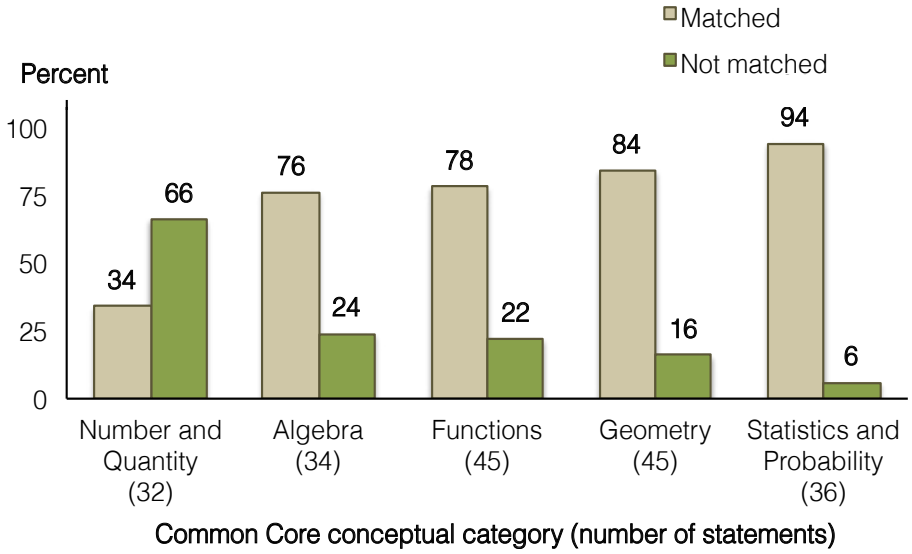


Table C6. Summary for Alignment Between the Texas College and Career Readiness Standards and Common Core Standards in Mathematics

Common Core mathematics conceptual category	Categorical Concurrence	Coverage
Number and Quantity	●	●
Algebra	●	●
Functions	●	●
Geometry	●	●
Statistics and Probability	●	●

● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
● Does not meet the criterion for Categorical Concurrence;
● means that in a majority of topics in the Common Core category have at least one matched comparison standard; ◐ means that in more than one topic in the Common Core category have at least one matched comparison standard; ○ means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

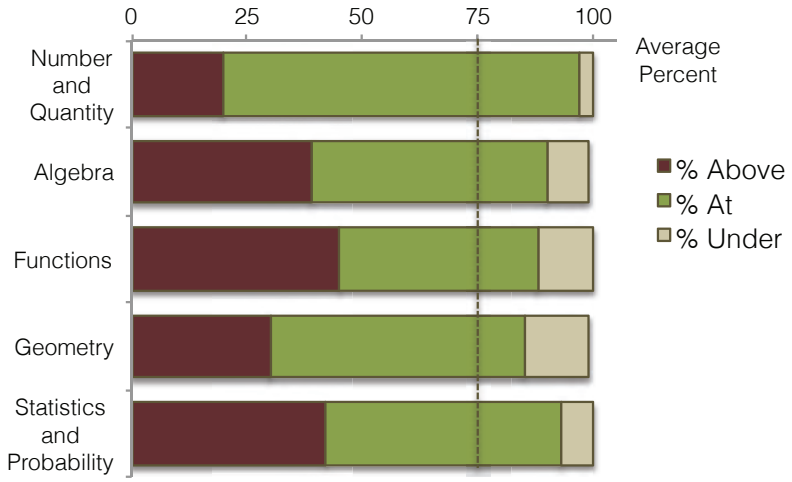
Breadth of Coverage

Breadth of Coverage is strong for all mathematics conceptual categories, indicating that the matching standards are distributed across a majority of Common Core mathematics clusters within each conceptual category. Table C6 summarizes the findings.

Depth of Knowledge

Across all matched standards in mathematics, an average of 53% (*SD* = 46) fall at the same level as the Common Core standards, with an average of 10% (*SD* = 28) of the Texas CCRS standards rated lower in cognitive demand and an average of 37% (*SD* = 45) rated higher. All five conceptual categories meet the DOK Consistency criterion.

Figure C18. Percent of Texas College and Career Readiness Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for Mathematics



Note: Total percent may equal slightly above or below 100 due to rounding.

Knowledge and Skills for University Success

English standards and mathematics standards sections from the Knowledge and Skills for University Success (KSUS) Standards were compared to the Common Core standards.

English Language Arts and Literacy Findings for the KSUS Standards

Match

Figure C19 shows the percent of Common Core statements (*n* = 113) that any of the nine ELA raters matched to one or more of the KSUS standards (*n* = 73). The figure collapses findings across all eight English language arts (ELA) and literacy strands. In Figure C20, we divide findings by strand. As the bar graphs indicate, the KSUS standards have matches for 100% of the Common Core standards for the Reading for Literature strand. The KSUS standards have matches to 79–96% of the Common Core standards for six strands. They have matches to 60% of the Common Core standards in the Reading Standards in Science and Technical Subjects strand.[5] Every strand meets the criterion for the Categorical Concurrence statistic, which specifies that, across raters, an average of one correspondence in a content area is sufficient.

[5]The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 3 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each strand. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Figure C19. Percentage of Common Core Standards that Match Knowledge and Skills for University Success Standards, for ELA and Literacy

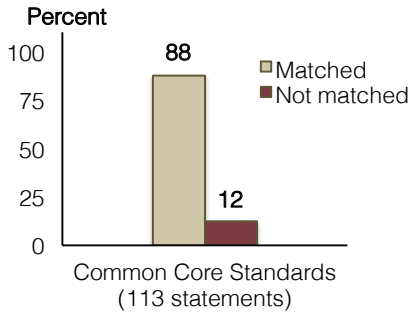


Figure C20. Percentage of Common Core Standards that Match Knowledge and Skills for University Success Standards, by ELA and Literacy Strand

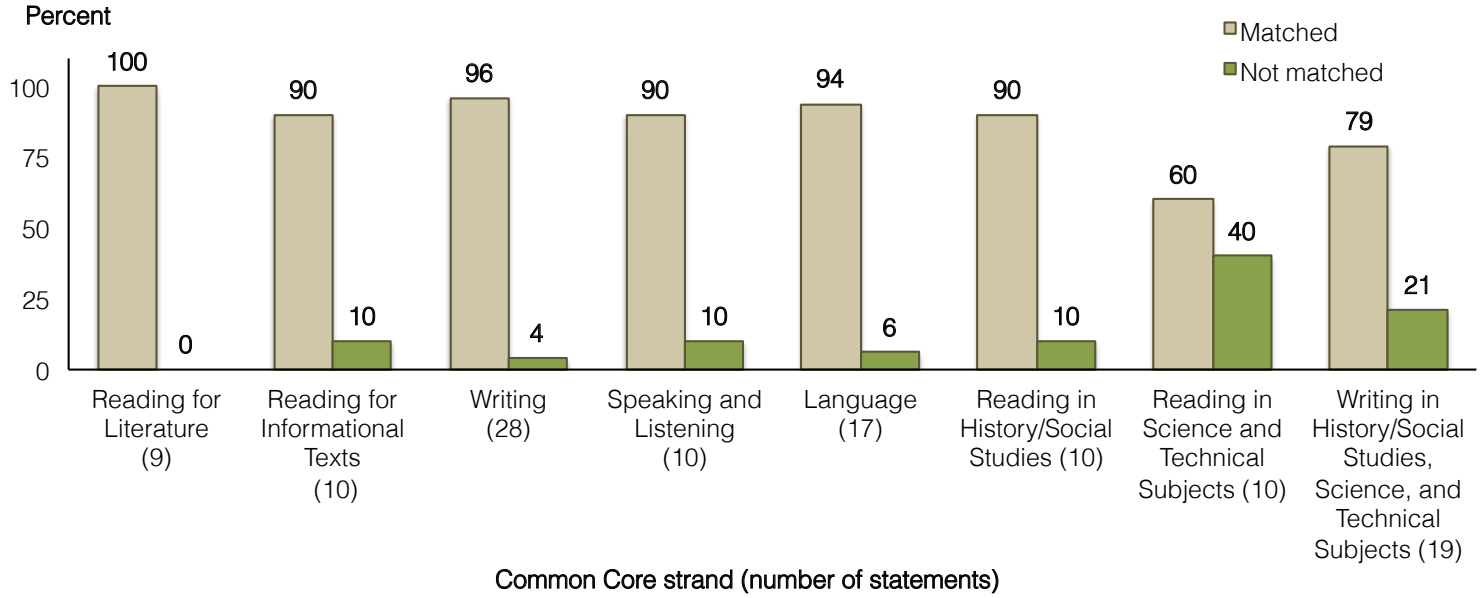


Table C7. Summary for Alignment Between the Knowledge and Skills for University Success Standards and the Common Core Standards in English Language Arts and Literacy

Common Core ELA and literacy strand	Categorical Concurrence	Coverage
Reading for Literature	●	●
Reading for Informational Texts	●	●
Writing	●	●
Speaking and Listening	●	●
Language	●	●
Reading in History/Social Studies	●	●
Reading in Science and Technical Subjects	●	●
Writing in History/Social Studies, Science, and Technical Subjects	●	●

● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
● Does not meet the criterion for Categorical Concurrence;
● means that in a majority of topics in the Common Core category have at least one matched comparison standard;
● means that in more than one topic in the Common Core category have at least one matched comparison standard;
○ means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

Breadth of Coverage

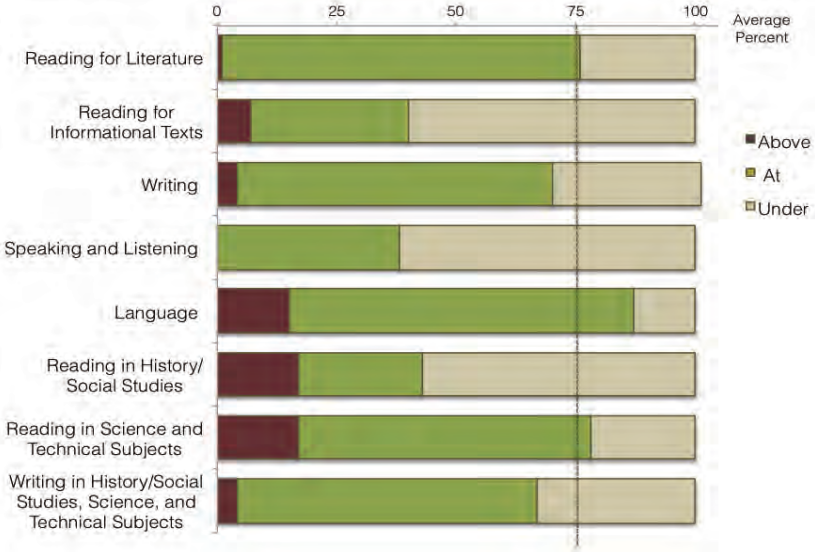
Breadth of Coverage is rated as strong for all the ELA and literacy strands (the majority of Common Core topics have matching comparison standards within them). This means that the KSUS standards that match Common Core standards are distributed across content topics within each Common Core strand. Table C7 presents the alignment summary for the Webb and Cook alignment statistics (Cook, 2005; Cook & Wilmes, 2007; Webb, 2002a).

Depth of Knowledge

Across all matched standards for KSUS in ELA and literacy, an average of 63% (*SD* = 45) fall at the same DOK level as the Common Core standards, with an average of 31% (*SD* = 44) rated lower in cognitive demand and an average of 6% (*SD* = 23) rated higher. Three strands (Reading Standards for Literature, Language Standards, and Reading Standards for Literacy in Science and Technical Subjects) meet the DOK Consistency criterion.

Three strands (Reading Standards for Literature; Language Standards; and Reading Standards for Literacy in Science and Technical Subjects) meet the DOK Consistency criterion, which is based on at least 75% of the matching KSUS standards being at or above the DOK of the corresponding Common Core standard. As Figure C21 shows, some strands fall close to 75% and results would be different if an alternative criterion had been selected.

Figure C21. Percent of Knowledge and Skills for University Success Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for ELA and Literacy



Note: Total percent may equal slightly above or below 100 due to rounding.

Mathematics Findings for the KSUS Standards

Match

Figure C22 shows the percent of Common Core statements (n = 192) that any of the seven mathematics raters matched to one or more of the KSUS standards (n = 83). The figure collapses findings across the five conceptual categories. In Figure C23, we divide findings by conceptual category. As the bar graphs indicate, the KSUS have matches to 82–89% of the Common Core standards in the Algebra, Functions, and Geometry conceptual categories. They have matches to 53% of the Common Core standards in the Number and Quantity conceptual category and 31% in the Statistics and Probability category.[6] Every conceptual category meets the criterion for the Categorical Concurrence statistic.

[6]The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 4 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each conceptual category. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Figure C22. Percentage of Common Core Standards that Match Knowledge and Skills for University Success Standards, for Mathematics

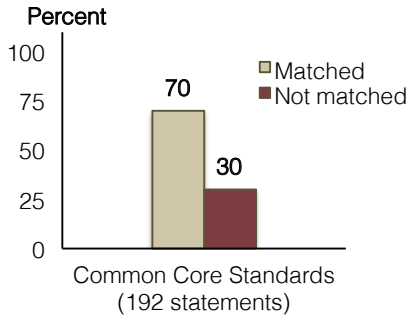


Figure C23. Percentage of Common Core Standards that Match Knowledge and Skills for University Success Standards, by Mathematics Conceptual Category

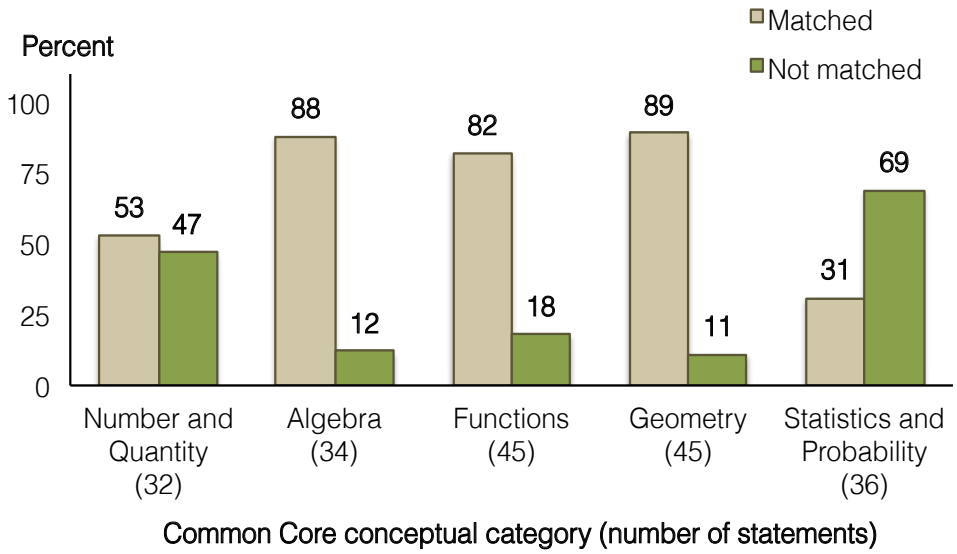


Table C8. Summary for Alignment Between the Knowledge and Skills for University Success Standards and Common Core Standards in Mathematics

Common Core mathematics conceptual category	Categorical Concurrence	Coverage
Number and Quantity	●	●
Algebra	●	●
Functions	●	●
Geometry	●	●
Statistics and Probability	●	●

● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
● Does not meet the criterion for Categorical Concurrence;
● means that in a majority of topics in the Common Core category have at least one matched comparison standard; ● means that in more than one topic in the Common Core category have at least one matched comparison standard; ○ means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

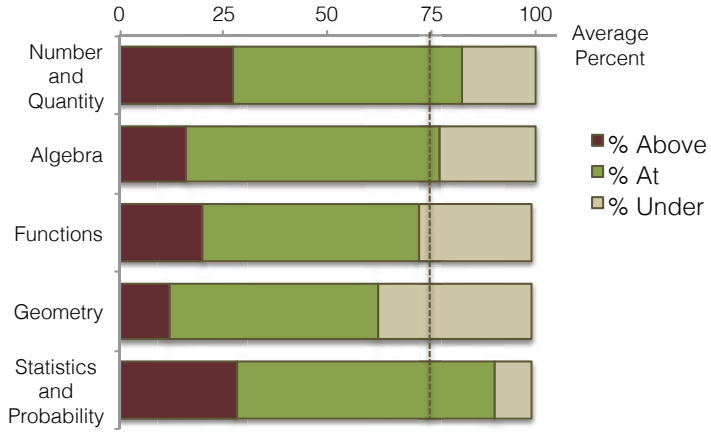
Breadth of Coverage

Breadth of Coverage is strong for all the mathematics conceptual categories (the majority of Common Core clusters have matching comparison standards within them). Table C8 presents the summarized results for mathematics.

Depth of Knowledge

Across conceptual categories in mathematics, for those KSUS standards that match Common Core standards, an average of 55% (*SD* = 47) fall at the same level, an average of 26% (*SD* = 43) are lower, and an average of 18% (*SD* = 37) are higher in cognitive demand. Three of the five Common Core conceptual categories meet the DOK Consistency criterion (see Figure C24), with Functions and Geometry being the two categories that do not meet the criterion. As Figure C24 shows, some categories fall close to 75% and results would be different if an alternative criterion had been selected.

Figure C24. Percent of Knowledge and Skills for University Success Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for Mathematics

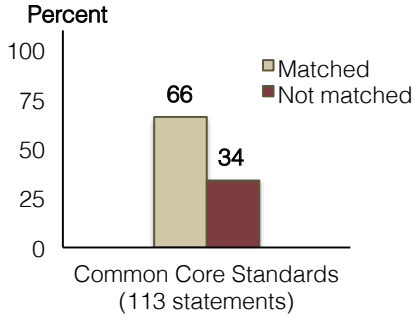


Note: Total percent may equal slightly above or below 100 due to rounding.

International Baccalaureate Standards

We compared the International Baccalaureate (IB) Standards for the Diploma Programme to the Common Core standards. For English language arts we used the course standards for A1 Language, Extended Essay, and Theory of Knowledge. For mathematics we used Mathematical Studies, Standard Level, Higher Level course standards. The study did not include any content from IB "options." These are additional required components that each IB school selects. The number of options varies by course and by subject. The IB options do not have specific standards.

Figure C25. Percentage of Common Core Standards that Match International Baccalaureate Standards, for ELA and Literacy



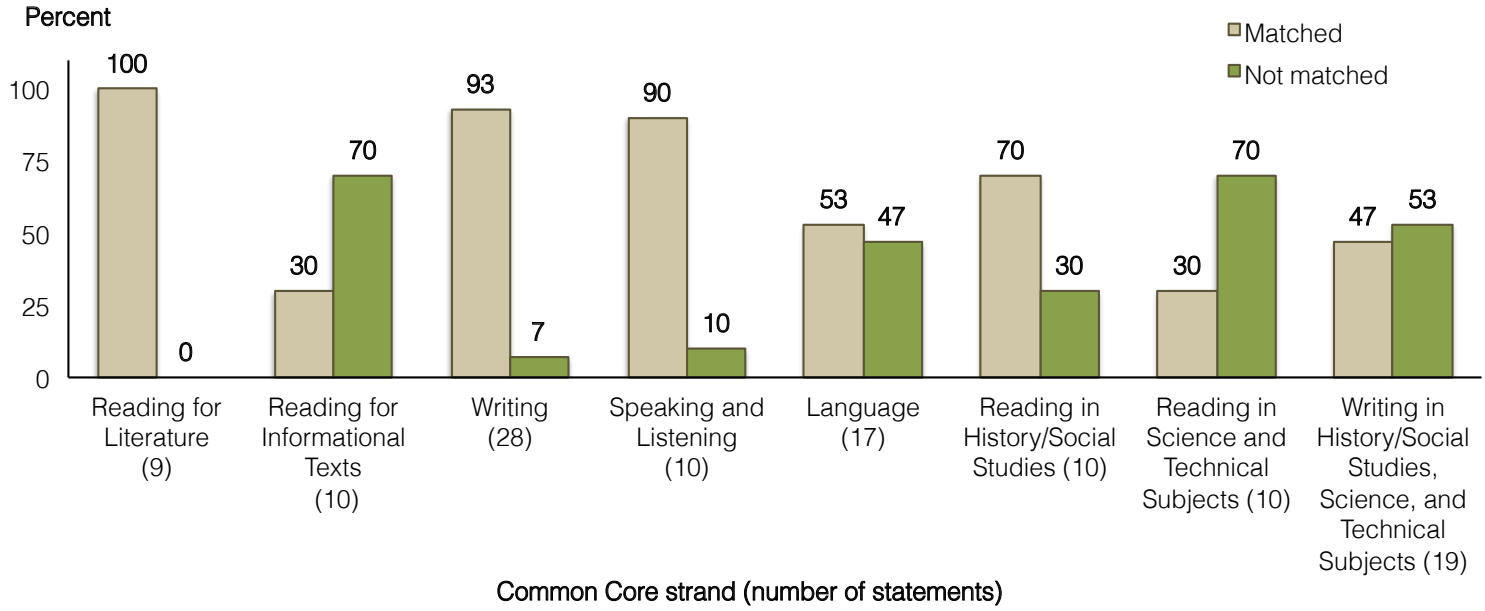
English Language Arts and Literacy Findings for the IB Standards

Match

Recall that raters identified up to three Common Core standards that correspond with each IB standard. Figure C25 shows the percent of Common Core statements (n = 113) that any of the nine English Language Arts (ELA) raters matched to one or more of the IB standards (n = 49). The figure collapses findings across all eight ELA and literacy strands. In Figure C26, we divide findings by strand. As the bar graphs indicate, the IB standards have matches for 100% of the Common Core standards in the Reading for Literature strand. The IB standards have matches to 70–93% of the Common Core standards in the Writing, Speaking and Listening, and Reading Standards in History/Social Studies strands. They have matches to 30–53% of the Common Core standards in the remaining four strands.[7] Six of the eight strands meet the criterion for the Categorical Concurrence statistic; the Language strand and the Reading Standards in Science and Technical Subjects strand do not.

[7]The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 3 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each strand. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Figure C26. Percentage of Common Core Standards that Match International Baccalaureate Standards, by ELA and Literacy Strand



Depth of Knowledge

Overall, for those IB ELA and literacy standards that match the Common Core, an average of 63% (*SD* = 44) of the IB standards fall at the same Depth of Knowledge (DOK) as the Common Core standards across all strands. An average of 20% (*SD* = 37) of the IB standards are rated lower, and an average of 17% (*SD* = 35) are rated higher in cognitive demand. Of the six strands that meet the criterion for the Categorical Concurrence statistic, four strands meet the criterion for the DOK Consistency statistic. Figure C27 depicts the results graphically. As the figure shows, some strands fall close to 75% and results would therefore be different if an alternative criterion had been selected.

Table C9. Summary for Alignment Between the International Baccalaureate Standards and Common Core Standards in English Language Arts and Literacy

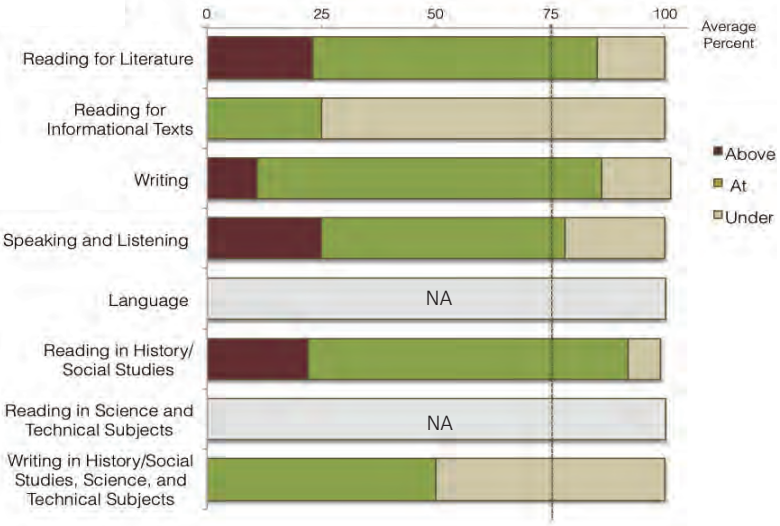
Common Core ELA and literacy strand	Categorical Concurrence	Coverage
Reading for Literature	●	●
Reading for Informational Texts	●	◐
Writing	●	●
Speaking and Listening	●	●
Language	●	○
Reading in History/Social Studies	●	●
Reading in Science and Technical Subjects	●	●
Writing in History/Social Studies, Science, and Technical Subjects	●	●

● Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
● Does not meet the criterion for Categorical Concurrence;
● means that in a majority of topics in the Common Core category have at least one matched comparison standard;
◐ means that in more than one topic in the Common Core category have at least one matched comparison standard;
○ means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

Breadth of Coverage

Breadth of Coverage is strong for five of the ELA and literacy strands (for these, the majority of Common Core topics have matching comparison standards within them). This means that the IB standards that match to Common Core standards are distributed across content topics within those five Common Core strands. One strand (Reading for Informational Texts) has moderate coverage. This means that Common Core standards match to IB standards in more than one topic but not a majority of topics within the strand. One strand (Language) has limited coverage; there is one topic that has Common Core standards with matches to the IB standards. Table C9 presents the summary of the alignment statistics for the Webb and Cook alignment statistics (Cook, 2005; Cook & Wilmes, 2007; Webb, 2002).

Figure C27. Percent of International Baccalaureate Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for ELA and Literacy



Note: Total percent may equal slightly above or below 100 due to rounding.

Mathematics Findings for the IB Standards

Match

Figure C28 shows the percent of Common Core statements (*n* = 192) that any of the seven mathematics raters matched to one or more of the IB standards (*n* = 189). The figure collapses findings across the five conceptual categories. In Figure C29, we divide findings by conceptual category. As the bar graphs indicate, the IB standards have matches to 76–97% of the Common Core standards in four of the conceptual categories. They have matches to 44% of the Common Core standards in the Geometry conceptual category.[8] Every conceptual category meets the criterion for the Categorical Concurrence statistic.

[8]The data presented here is based on at least one rater matching at least one standard, however the number of matches for any given standard varies widely. Chapter 4 provides the mean and standard deviation for the number of comparison standards matching Common Core standards in each conceptual category. The Technical Supplement displays the exact standards from the Common Core and the comparison sets that were matched.

Figure C28. Percentage of Common Core Standards that Match International Baccalaureate Standards, for Mathematics

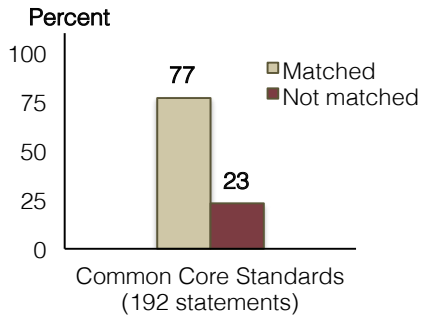


Figure C29. Percentage of Common Core Standards that Match International Baccalaureate Standards, by Mathematics Conceptual Category

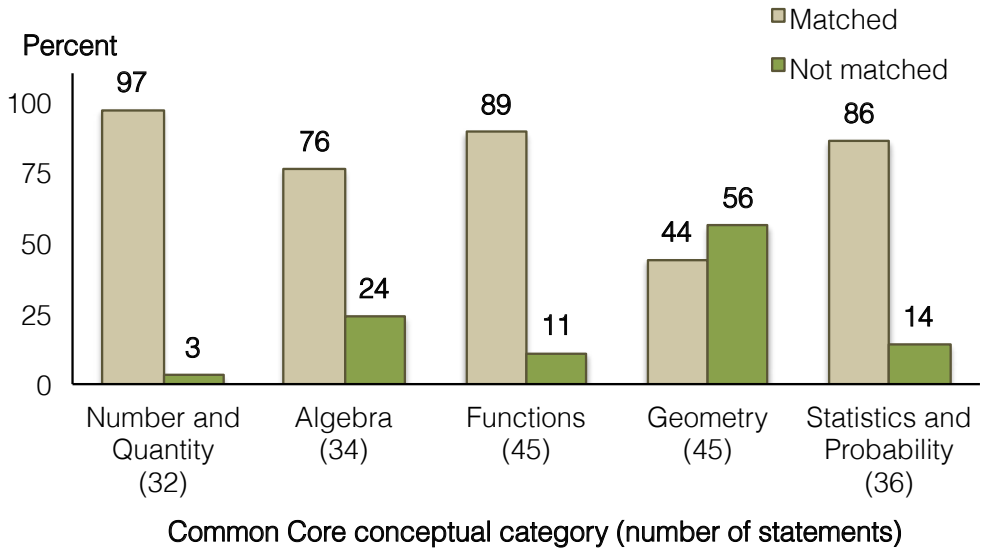


Table C10. Summary of Alignment for the International Baccalaureate Standards and Common Core Standards in Mathematics

Common Core mathematics conceptual category	Categorical Concurrence	Coverage
Number and Quantity		
Algebra		
Functions		
Geometry		
Statistics and Probability		

Meets the criterion for Categorical Concurrence (averaged across raters, a single correspondence exists between the two sets of standards);
Does not meet the criterion for Categorical Concurrence;
means that in a majority of topics in the Common Core category have at least one matched comparison standard;
means that in more than one topic in the Common Core category have at least one matched comparison standard;
means that in one or less than one topic in the Common Core category have at least one matched comparison standard.

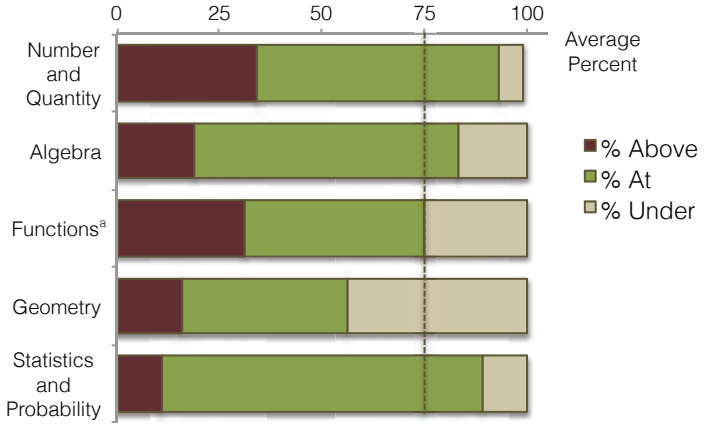
Breadth of Coverage

Breadth of Coverage is strong for all the mathematics conceptual categories (the majority of Common Core clusters have matching comparison standards within them). Table C10 presents the summarized alignment results for mathematics.

Depth of Knowledge

For those IB mathematics standards that match Common Core content, an average of 57% (*SD* = 46) of standards fall at the same level of cognitive demand as the Common Core standards across all mathematics conceptual categories. An average of 19% (*SD* = 38) of the IB standards fall lower in cognitive demand than the Common Core standards, and an average of 23% (*SD* = 40) fall above the Common Core standards. Three of the five Common Core conceptual categories meet the DOK Consistency criterion (see Figure 30), with Functions and Geometry being the two categories that do not meet the criterion. As Figure C30 shows, some categories fall close to or at 75% and results would be different if an alternative criterion had been selected.

Figure C30. Percent of International Baccalaureate Standards Under, At, or Above the Depth of Knowledge Level of the Common Core Standards, for Mathematics



Note: Total percent may equal slightly above or below 100 due to rounding.
[a]The Functions conceptual category does not meet the DOK criterion, but due to rounding, the value appears at exactly 75%.

Number of Alignment Matches for Common Core English Language Arts and Literacy Topics, by Comparison Standard Set

The tables that follow present more information about the distribution of standard matches within each of the eight English language arts (ELA) and literacy strands. Specifically, the tables show the total number of matches that all raters made for each topic (the subareas within a strand). The tables illustrate that there is certain content within a strand that tends to have more concentration of matches than other categories within the same strand. Note that the number of rated statements (shown in parentheses) also varies across topic. Chapter 3 presented the average number of matches per standard for each topic across all comparison sets.

Table D1. Number of Matches Within Each Common Core Topic in the Reading for Literature Strand

Topic (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Key Ideas and Details (3)	40	20	18	30	22	**130**
Craft and Structure (3)	48	40	33	27	15	**163**
Integration of Knowledge and Ideas (2)	42	22	27	26	15	**132**
Range of Reading and Level of Text Complexity (1)	11	8	12	14	19	**64**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D2. Number of Matches Within Each Common Core Topic in the Reading for Informational Texts Strand

Topic (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Key Ideas and Details (3)	12	9	31	12	1	**65**
Craft and Structure (3)	22	30	31	5	0	**88**
Integration of Knowledge and Ideas (3)	18	6	24	4	4	**56**
Range of Reading and Level of Text Complexity (1)	2	0	3	3	5	**13**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D3. Number of Matches Within Each Common Core Topic in the Writing Strand

Topic (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Text Types and Purposes (19)	125	44	46	92	76	**383**
Production and Distribution of Writing (3)	33	20	61	31	17	**162**
Research to Build and Present Knowledge (5)	21	10	78	44	55	**208**
Range of Writing (1)	5	3	11	3	6	**28**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D4. Number of Matches Within Each Common Core Topic in the Speaking and Listening Strand

Topic (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Comprehension and Collaboration (7)	54	20	90	19	24	**207**
Presentation of Knowledge and Ideas (3)	98	25	42	8	14	**187**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D5. Number of Matches Within Each Common Core Topic in the Language Strand

Topic (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Conventions of Standard English (6)	26	36	18	48	0	**128**
Knowledge of Language (2)	5	6	4	12	0	**27**
Vocabulary Acquisition and Use (9)	13	32	55	40	2	**142**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D6. Number of Matches Within Each Common Core Topic in the Reading for Literacy in History/Social Studies Strand

Topic (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Key Ideas and Details (3)	20	1	13	5	2	**41**
Craft and Structure (3)	19	3	6	6	1	**35**
Integration of Knowledge and Ideas (3)	16	1	12	7	9	**45**
Range of Reading and Level of Text Complexity (1)	1	0	1	3	1	**6**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D7. Number of Matches Within Each Common Core Topic in the Reading for Literacy in Science and Technical Subjects Strand

Topic (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Key Ideas and Details (3)	3	1	10	3	2	**19**
Craft and Structure (3)	5	1	14	5	0	**25**
Integration of Knowledge and Ideas (3)	1	0	16	1	3	**21**
Range of Reading and Level of Text Complexity (1)	0	0	2	0	1	**3**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D8. Number of Matches Within Each Common Core Topic in the Writing for Literacy in History/ Social Studies, Science, and Technical Subjects Strand

Topic (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Text Types and Purposes (12)	13	2	19	22	4	**60**
Production and Distribution of Writing (3)	4	5	16	12	2	**39**
Research to Build and Present Knowledge (3)	3	2	16	18	11	**50**
Range of Writing (1)	0	0	4	1	2	**7**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Number of Alignment Matches for Common Core Clusters, by Comparison Standard Set for Mathematics

The tables that follow present more information about the distribution of standard matches within each of the five Common Core mathematics conceptual categories. Specifically, the tables show the total number of matches that all raters made for each cluster (the subareas within a conceptual category). The tables illustrate that there are certain clusters within a category that tend to have more concentration of matches than other clusters within the same category. Note that the number of rated statements (shown in parentheses) also varies across cluster. Chapter 4 presented the average number of matches per standard for each cluster across all comparison sets.

Table D9. Number of Matches Within Each Common Core Cluster in the Number and Quantity Conceptual Category

Cluster (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Extend the properties of exponents to rational exponents (2)	15	11	4	19	1	**50**
Use properties of rational and irrational numbers (1)	7	4	1	0	2	**14**
Reason quantitatively and use units to solve problems (3)	1	18	22	8	9	**58**
Perform arithmetic operations with complex numbers (3)	13	17	19	4	5	**58**
Represent complex numbers and their operations on the complex plane (3)	23	19	2	2	9	**55**
Use complex numbers in polynomial identities and equations (3)	4	10	0	0	13	**27**
Represent and model with vector quantities (3)	6	7	0	1	23	**37**
Perform operations on vectors (7)	19	22	0	1	24	**66**
Perform operations on matrices and use matrices in applications (7)	23	9	0	0	36	**68**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D10. Number of Matches Within Each Common Core Cluster in the Algebra Conceptual Category

Cluster (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Interpret the structure of expressions (4)	8	5	16	19	8	**56**
Write expressions in equivalent forms to solve problems (5)	30	20	13	31	36	**130**
Perform arithmetic operations on polynomials(1)	12	6	6	2	1	**27**
Understand the relationship between zeros and factors of polynomials (2)	6	4	0	5	16	**31**
Use polynomial identities to solve problems (2)	7	10	0	0	6	**23**
Rewrite rational expressions (2)	25	5	6	13	2	**51**
Create equations that describe numbers or relationships (4)	8	9	35	12	5	**69**
Understand solving equations as a process of reasoning and explain the reasoning (2)	22	10	9	9	2	**52**
Solve equations and inequalities in one variable (4)	40	44	6	20	8	**118**
Solve systems of equations (5)	53	32	15	8	21	**129**
Represent and solve equations and inequalities graphically (3)	16	17	19	14	14	**80**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D11. Number of Matches Within Each Common Core Cluster in the Functions Conceptual Category

Cluster (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Understand the concept of a function and use function notation (3)	16	22	23	18	12	**91**
Interpret functions that arise in applications in terms of the context (3)	16	23	17	11	18	**85**
Analyze functions using different representations (10)	38	30	39	20	86	**213**
Build a function that models a relationship between two quantities (5)	16	34	24	13	25	**112**
Build new functions from existing functions (7)	18	21	12	14	22	**87**
Construct and compare linear and exponential models and solve problems (7)	20	31	30	23	28	**132**
Interpret expressions for functions in terms of the situation they model (1)	0	1	1	3	2	**7**
Extend the domain of trigonometric functions using the unit circle (4)	20	14	1	10	32	**77**
Model periodic phenomena with trigonometric functions (3)	17	3	1	6	35	**62**
Prove and apply trigonometric identities (2)	20	15	0	4	12	**51**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D12. Number of Matches Within Each Common Core Cluster in the Geometry Conceptual Category

Cluster (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Experiment with transformations in the plane (5)	7	10	18	2	3	**40**
Understand congruence in terms of rigid motions (3)	12	5	9	1	0	**27**
Prove geometric theorems (3)	11	6	8	16	0	**41**
Make geometric constructions (2)	7	8	5	5	1	**26**
Understand similarity in terms of similarity transformations (5)	3	5	6	3	0	**17**
Prove theorems involving similarity (2)	16	18	6	9	0	**49**
Define trigonometric ratios and solve problems involving right triangles (3)	29	25	16	11	25	**106**
Apply trigonometry to general triangles (3)	12	17	1	5	15	**50**
Understand and apply theorems about circles (4)	15	16	4	4	1	**40**
Find arc lengths and areas of sectors of circles (1)	1	1	2	0	4	**8**
Translate between the geometric description and the equation for a conic section (3)	24	11	2	14	0	**51**
Use coordinates to prove simple geometric theorems algebraically (4)	24	32	20	14	16	**106**
Explain volume formulas and use them to solve problems (3)	21	6	12	6	11	**56**
Visualize relationships between two-dimensional and three-dimensional objects (1)	1	4	5	4	3	**17**
Apply geometric concepts in modeling situations (3)	1	4	18	10	5	**38**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate

[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Table D13. Number of Matches Within Each Common Core Cluster in the Statistics and Probability Conceptual Category

Cluster (number of statements)	Cumulative number of matches[a]					
	CA	MA	TCCRS	KSUS	IB	**All standards**
Summarize, represent, and interpret data on a single count or measurement variable (4)	34	36	52	13	54	**189**
Summarize, represent, and interpret data on two categorical and quantitative variables (5)	19	32	58	16	32	**157**
Interpret linear models (3)	10	7	5	1	18	**41**
Understand and evaluate random processes underlying statistical experiments (2)	10	21	23	0	6	**60**
Make inferences and justify conclusions from sample surveys, experiments, and observational studies (4)	3	18	43	1	3	**68**
Understand independence and conditional probability and use them to interpret data (5)	26	1	23	1	41	**92**
Use the rules of probability to compute probabilities of compound events in a uniform probability model (4)	28	7	7	0	26	**68**
Calculate expected values and use them to solve problems (4)	16	0	3	0	24	**43**
Use probability to evaluate outcomes of decisions (5)	2	0	9	0	12	**23**

CA = California; MA = Massachusetts; TCCRS = Texas College and Career Readiness Standards; KSUS = Knowledge and Skills for University Success; IB = International Baccalaureate
[a]These matches are cumulative across all raters, meaning that the results show all ratings, including when raters matched the same Common Core standard multiple times within one comparison set of standards and across multiple comparison sets of standards.

Attachment 4h

Alignment of Texas CCRS and College Admission/Placement Test Items

Texas Test Alignment Project Final Report

Texas Higher Education Coordinating Board

April 15, 2010

By
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Educational Policy Improvement Center

Executive Summary

The Texas Test Alignment Project is a component of the Texas College and Career Readiness Initiative. The purpose of the Texas Alignment Project is to determine the degree to which six college admissions and placement tests assess the Texas College and Career Readiness Standards (TCCRS). As required by state law, (Texas Education Code, Section 51.3062, Texas Success Initiative), the Texas Higher Education Coordinating Board (THECB) has approved the use of various assessments by Texas public institutions of higher education to measure the readiness of students to enter into entry-level college courses. This study describes the extent to which these THECB-approved college admission and placement tests assess the knowledge and skills students must possess to be college ready in Texas.

To determine these relationships, testing companies for the ACT, SAT, ACCUPLACER, COMPASS, ASSET, and the Texas Higher Education Assessment (THEA) provided more than 2,500 mathematics and English and language arts (ELA) items. Nationally recognized mathematics and English experts were recruited and trained to review each of these items via an online rating system developed specially for this project. The experts first rated the rigor and cognitive demand of each TCCRS and each test item and then identified any matches between the knowledge and skill defined in a TCCRS performance expectation and what was assessed by a test item. Study design utilized nationally-accepted alignment methodology that yield measures of alignment, depth of knowledge, content coverage, rigor and cognitive demand.

Key findings include the following:

- The TCCRS performance expectations are, on average, more rigorous than the test items. The TCCRS ELA performance expectations are more rigorous than the TCCRS mathematics performance expectations.

- The TCCRS performance expectations are more cognitively demanding, on average, than the test items. The TCCRS ELA performance expectations are slightly more cognitively demanding than the TCCRS mathematics performance expectations.

- With few exceptions, the tests cover similar TCCRS performance expectations in mathematics and ELA. Tests that have unique coverage in specific areas are the

SAT and THEA in statistical reasoning and the SAT in research.

- The most-assessed TCCRS organizing components are writing, algebraic reasoning, and problem solving and reasoning. The least assessed are applied skills and research, probabilistic reasoning, and statistical reasoning.

- Some expectations are not assessed by any of the test items. These include practical and applied skills (research and planning skills and some complex reading and mathematics analysis tasks) that simply may not be assessable by multiple-choice or standardized tests as currently designed.

- Although none of the tests demonstrate high levels of alignment with all of the cross-disciplinary skills, some items do assess problem solving, reading across the curriculum, writing across the curriculum. Tests demonstrate more alignment with the key cognitive strategies than with the foundational skills.

- Nearly all TCCRS performance expectations are rated higher in rigor than the test items assessing them, except for numeric reasoning, algebraic reasoning, measurement reasoning, functions, communications, and representation in mathematics and writing in ELA.

- Nearly all performance expectations are rated higher in cognitive demand than the test items assessing them, except for numeric reasoning, algebraic reasoning, measurement reasoning and probabilistic reasoning, and functions in mathematics. No performance expectations are rated lower in cognitive demand than the test items assessing them in ELA.

On the whole, these findings indicate that admissions and placement tests provide coverage of some, but not all, the knowledge and skills specified in the TCCRS. To assess all of the TCCRS, it likely will be necessary that additional measures be used. This statement is particularly true in the areas of the key cognitive strategies and foundational skills.

A clearer understanding of what is measured by admissions and placement tests will help Texas educators and policy makers better align high school and college curriculum and instruction and to develop a more comprehensive and appropriate assessment system. Such a system would monitor and assess specific knowledge and skills necessary for college readiness and success. The net result would be an educational system that sends clearer messages to students regarding what they need to do to be college ready and that yields more informative data about the degree to which students are ready to undertake postsecondary studies.

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Introduction

Although the number of high school graduates pursuing higher education has increased during the last 30 years, between 30 percent and 60 percent of college freshmen require remedial education (NCES, 2004). A student may be *college-eligible*—that is, able to meet college admissions requirements—without being college ready (Conley, 2005). To be college ready, a student must attain a level of preparation to enroll and succeed—without remediation—in credit-bearing general education courses at the postsecondary level (Conley, 2007). Not only does remedial education cost an estimated $1 billion annually, but students requiring it are far less likely to graduate (ACT, 2005). As a result, significant attention is now directed to understanding and remedying the gap between what high school graduates know and are capable of and what entry-level college students need to know and are capable of.

Addressing the lack of preparedness of high school graduates for college-level coursework requires identifying the gaps in content between what is taught in high school and what is expected of students in college. It also requires appropriate and comprehensive measures for educators to monitor progress toward closing this gap.

One option for monitoring the developing college preparedness of high school students is through state assessments. Required state high school assessments often shape what gets emphasized in classrooms. Many states do not yet explicitly align the content knowledge and skills assessed by the state tests with those required for college success. Conley (2003) and Brown and Conley (2007) evaluated state tests and found that the content of state high school tests is inconsistently and only moderately aligned with college readiness standards in 20 states in mathematics and ELA. They find slightly more alignment with the ELA exams than with the mathematics exams, yet the ELA exams align poorly or not at all in areas requiring higher levels of thinking, and the mathematics exams have the highest alignment in basic skills content areas. The findings describe the gap between student learning expectations and what they are expected to know to be ready for college and provide evidence that state tests are not aligned well enough with college readiness standards to be useful for providing feedback to high school students and teachers concerning college readiness.

Consequently, many students graduating from high school and passing their state's high-stakes assessments are not sure how well prepared they are for postsecondary coursework.

College admissions and placement tests, then, become more important means for assessing college preparedness. Colleges and universities use scores on placement exams for a variety of purposes but most often for determining whether a student should have to take a remedial course before being allowed access to credit-bearing, college-level courses. Even though these exams are explicitly college-focused, evidence suggests that they are only moderately aligned with college readiness standards. Brown and Niemi (2007), for example, investigated the alignment of high school test content and community college test placement content (ACCUPLACER and COMPASS) and find that the content of ELA tests are adequately aligned but that mathematics tests are aligned only in depth-of-knowledge consistency. This study focuses on community college expectations, however, and the results may not generalize fully to four-year institutions. Achieve, Inc. (2007), also analyzes the alignment of admissions and placement exams in mathematics and English (ACT, SAT, ACCUPLACER, COMPASS, THEA) with the American Diploma Project (ADP) benchmarks. Their analysis, which may be considered more generalizable, finds that the ACT and SAT are generally more demanding than placement tests and demonstrate better coverage of a range of content knowledge. All the tests fell short of measuring the full set of knowledge and skills encompassed by the ADP benchmarks. Overall, the study finds that the tests place too much emphasis on low-level content taught earlier in a student's high school education or even in middle school.

Texas is a leader in the movement to align high school curricula and assessments with college readiness expectations, beginning with the initiation of *Closing the Gaps by 2015* in 2000, a plan to ensure high school students are prepared for college and the skilled workforce (THECB, 2009). In 2006, the Texas Legislature passed several initiatives related to high school success and college and career readiness. The legislation supports the goal of increasing the number of students who graduate from Texas high schools ready to succeed in college and 21st century careers and resulted

in the *Texas College and Career Readiness Initiative* (TCCRI). The objectives of the TCCRI are to develop college and career readiness standards and to implement activities that improve alignment between secondary and postsecondary education, resulting in an increased number of students prepared for college and career success. As one of the initial activities of the TCCRI, vertical teams of public high school and higher education faculty developed draft college and career readiness standards under the joint leadership of the Texas Higher Education Coordinating Board (THECB) and the Texas Education Agency. With public input on the draft standards, the Texas College and Career Readiness Standards (TCCRS) were revised with final adoption by the THECB and the Commissioner of Education in 2008. Texas was one of the first states to adopt a specific and comprehensive definition of college readiness that is being used by the Texas' State Board of Education in revising essential knowledge and skill standards for the state.

With the foundation of college and career readiness standards in place, Texas is prepared to take the next steps in improving college readiness: to ascertain the alignment of postsecondary placement with the TCCRS. By doing so, the THECB can ascertain the alignment of its measures of placement with the state standards and can modify placement procedures and practices so that incoming students who focus on meeting the TCCRS while in high school are placed into college courses accordingly.

Study Purpose

The purpose of the Texas Test Alignment Project (TAP) is to examine the alignment of THECB-approved college admission and placement tests used by Texas institutions of higher education to measure college readiness with the TCCRS. As such, the goal of the current study is not to identify the *best* test to assess the TCCRS, but to ascertain the discrepancy between current practice and the desired goal of complete measurement of the TCCRS. This study addresses the following research objectives:

Are college admissions and placement tests able to measure the cognitive demand and rigor that are required by the TCCRS?

- Which content areas of the TCCRS are most and least rigorous and cognitively demanding?

- Which test(s) have a level of cognitive demand and rigor that is at a level similar to or higher than the corresponding rigor and cognitive-demand level of the expectations assessed?

Do college admissions and placement tests assess areas deemed important to THECB in terms of college readiness?

- Which test(s) are most aligned to the key content standards in mathematics and ELA?
- Which test(s) are most aligned with the cross-disciplinary skills?
- Do tests assess each standard and, if not, which standards are omitted?
- What are the areas of strongest alignment and what are the areas lacking in alignment?

Methodology

Test items from the THECB-approved placement and admissions tests used by Texas institutions of higher education to measure college readiness were obtained for the study. Content experts in mathematics and ELA first rated the rigor and depth of knowledge required by the TCCRS. The TCCRS are organized into three levels: key content areas, organizing components, and performance expectations. The reviewers made their judgments at the level of performance expectations by rating the cognitive complexity of each performance expectation and then determining whether each test item from each of the designated tests corresponds with one or more performance expectations. Every reviewer determined the relationship between each test item and the corresponding performance expectations. The results show the average cognitive complexity ratings and describe the relationship between performance expectations and test item's content (their categorical concurrence) and, when they match, whether rigor and depth of knowledge between the performance expectation and the test item is appropriate.

Alignment Methodology

Researchers have developed many ways to assess alignment (Rothman, 2004; Webb, 1997, 1999; Porter, 2002; ACHIEVE, 2000, 2001, and 2003; Wixson, Fisk, Dutro, and McDaniel, 2002). Webb's method is one of the more widely used ways to determine alignment between test items and educational standards. His approach however, is

often modified by alignment researchers (Impara, 2001).

This study also is based on Webb's methods, but were modified to better address the project's objectives. The primary deviation is to compute each metric across raters rather than by computing alignment metrics for each rater and then averaging them. Although the estimates may be slightly less sensitive to differences in reviewer ratings, they highlight the alignment between each of the tests and the TCCRS—as this alignment is a core objective of the study.

The methods used for each alignment metric of this study are described below. Each includes a description of the modification from Webb's approach as well as its justifications and implications.

- **Categorical concurrence** determines the extent that test items correspond to the TCCRS. Tests with more than six items assessing a standard are considered to demonstrate *categorical concurrence* with that standard. Webb computes the total number of items identified by each rater and then averages the number of items identified across reviewers. When the average across reviewers is greater than six, the criterion for categorical concurrence is met. This study describes the number of unique items per test (rather than the total number of matches across reviewers, who may repeat the same items), so each item identified as measuring a performance expectation is counted only once, even when it is identified by multiple reviewers. This provides the number of unique items identified by all reviewers from each test that measure each of the performance expectations. For calculating categorical concurrence, the criterion is for a test to have at least six unique items assessing each performance expectation. This modified measure provides a clearer picture of how many items from each test form or pool assess each performance expectation.

- **Depth-of-knowledge (DOK) consistency** is measured by comparing the DOK level required of the test item (as determined by the reviewers) with the DOK required to meet the standard (as determined by reviewers). It is computed for each rater as the percentage of items equal to or greater than the standards they assess in terms of cognitive complexity and rigor. Then the percentages are averaged across reviewers. The recommended benchmark is that at least one-half the assessment items are at or above the DOK required by the corresponding standard. It is modified by averaging ratings across reviewers and then across items, and then reports the average differences in rigor and cognitive demand between the items and the performance expectations. The resulting statistic is the average difference in rigor or cognitive demand between test items and the performance expectations they assess. It describes the difference between ratings and not just whether they are equal or not.

- **Range of knowledge** is the extent to which the TCCRS are assessed by items on a test. This criterion is typically measured as the average percent of standards addressed by one or more items on each test (across reviewers). It is modified to describe the number of items on each test that assesses each of the performance expectations and to report the percent of standards that had at least one item for each test assess it. It is calculated across reviewers and the suggested benchmark is for a test to cover at least half of the performance expectations described in the standards. In addition, this provides a more comprehensive view of the extent that the TCCRS are measured by the items on each test: it describes the total number of matches made for each performance expectation across raters.

Webb includes a fourth measure, *balance of representation*, to describe the extent that assessment items are evenly distributed across learning objectives. Previous research provides evidence that this is highly redundant with the range of knowledge measure (e.g., Brown and Conley, 2007). Furthermore, this measure describes the distribution of items and will be greatly dependent upon the number of items from each test that is included in the analysis. When there is great variation in test distribution (e.g., the number of items provided to represent each test), as in the current study, this distribution metric is more likely to be skewed and not be directly comparable across tests. For these reasons, balance of representation is not reported here.

The Career and College Readiness Standards

The TCCRS differ in several ways from traditional high school standards, which tend to encompass everything that all students need to know for a range of possible futures beyond high school. The TCCRS specify the content knowledge, thinking skills, and cognitive strategies necessary to succeed in entry-level postsecondary courses, without requiring remediation.

Appendix A provides the standards used in the study in three areas: mathematics, ELA, and cross-disciplinary skills. The speaking- and listening-content areas were excluded from the ELA standards because none of the tests were expected to assess speaking or listening skills.

Tests Included in the Study

This study included items from six mathematics and ELA (reading comprehension and

writing) tests: the ACT, SAT, ACCUPLACER, ASSET, COMPASS, and Texas Higher Education Assessment (THEA). The ACT and SAT are national college admissions tests. The THEA was developed specifically to evaluate the readiness of Texas students for college level coursework in Texas postsecondary institutions (THEA, 2009), but prior to the adoption of the TCCRS. The remaining tests are college course placement tests from national vendors. All items provided were operational in the 2008–2009 test pools. Items from the ACT, ASSET, SAT (ELA), and THEA represented intact test forms, and items from the COMPASS and ACCUPLACER comprised item banks representative of the test specifications. The SAT mathematics item set was selected to be representative of test specifications and was drawn from five intact test forms.

Vendors were allowed to submit what they felt was the most representative set of test items. Some chose to submit intact forms, and others sampled from item banks. This choice was a function of differences in test formats as much as anything else. Computer-adaptive tests in particular present unique challenges to conducting alignment studies because there is no identifiable test form *per se*. The precise set of items students view is based on their responses to a set of introductory items. This procedure is in contrast to a traditional paper-and-pencil instrument in which all students get exactly the same questions when using the same form.

To accommodate differences in test formats, some tests are represented by items selected from item pools or multiple forms, and not a single test form. In such cases, the items do not consistently reflect the actual number and coverage of items that would be provided to a student during test administration. What they do represent best is the test specifications (the knowledge domain used as the basis for item writing). As such, the results of the study can best be characterized as describing the degree of alignment between the item pools (or test specifications, as evidenced by the item set provided by each test developer) and the TCCRS performance expectations.

It is possible to imagine other means for determining the alignment of item pools, such as drawing a sample of items where the sample size is determined by the length of the test administered or sampling test content across administrations using multiple tests

administered to students. However, most alignment studies comparing the alignment of test forms and test item pools do not specifically address the lack of comparability between the two (Achieve, 2007; Brown and Niemi, 2007). In order to maintain the integrity of the item pools for this study, were included the entire test pools were included where provided.

The practical implication of this approach is that the degree of alignment observed for the two metrics that are influenced by item counts, and only those two metrics (i.e., categorical concurrence and range of knowledge), could potentially be influenced if an insufficiently representative set of items were analyzed. However, it is important to note that a follow-up analysis was performed to ascertain the practical effect of this potential influence, and the data demonstrate that any impact from the differences in number of items submitted is minimal and does not affect the overall conclusions of the study. It was assumed that individual tests were representative of the item pools, which were, in turn, representative of the test specifications. The results strongly suggest that the items drawn from each item pool are sufficiently representative of test specifications.

The ACCUPLACER and COMPASS are computer-adaptive tests; all others are administered via paper and pencil. Since the study began, ACCUPLACER has revised the scoring rubric for its writing test but not the writing prompts included in this study. Table 1 describes each test included in the study.

Table 1. Descriptive Summaries of Each Test

Descriptive Summaries of Each Test
ACT Produced by ACT, Inc., the ACT is a widely used, standardized, achievement examination for college admissions in the United States. It assesses high school students' general educational development and their ability to complete college-level work. • The multiple-choice tests cover four skill areas: English, mathematics, reading, and science. • The writing test, which is optional, measures skill in planning and writing a short essay (ACT, 2009a).

Descriptive Summaries of Each Test
ACCUPLACER Developed by the College Board, these computer-adaptive placement test modules measure: • Sentence skills • Reading comprehension • Arithmetic • Elementary algebra • College-level mathematics • Written essay The test provides students and faculty with useful information about students' academic skills (College Board, 2009a). The results of the assessment, in conjunction with student's academic background, goals, and interests, are used by academic advisors and counselors to determine course selection (College Board, 2009b).
ASSET ASSET is developed by ACT, Inc., and is a testing and advising program for placing students into postsecondary institutions, mostly technical and community colleges (ACT, 2009b). It measures: • Basic skills: writing, numerical, and reading • Advanced mathematics: elementary algebra, intermediate algebra, college algebra, and geometry
COMPASS Developed by ACT, Inc., these computer-adaptive college placement test modules help educators evaluate: • Reading • Writing skills • Essay writing • Mathematics (pre-algebra, algebra, college algebra, geometry, and trigonometry) • English as a second language This test helps determine the appropriate placement of students in college-level courses and connects them to resources to improve academic success (ACT, 2009c).
SAT Developed by the College Board, the SAT Reasoning Test (formerly Scholastic Aptitude Test and Scholastic Assessment Test) is a standardized test widely used for college admissions in the United States. The Educational Testing Service (ETS) administers the exam. It tests students' knowledge of: • Critical reading • Writing • Mathematics
THEA This assesses the reading, mathematics, and writing skills that freshman-level students should have if they are to perform effectively in undergraduate, certificate, or degree programs in Texas public colleges or universities (THEA, 2009). Developed by the Evaluation Systems group of Pearson and approved by the Texas Higher Education Coordinating Board, the purpose of the Texas Higher Education Assessment is to evaluate: • Reading • Mathematics • Writing

Although the THEA was developed to assess the college readiness of Texas students in reading, writing, and mathematics, it was developed prior to the adoption of the TCCRS. And since the tests available through ACT and the College Board were not designed to address the needs of Texas students in particular, no individual test was developed specifically to comprehensively assess all of the TCCRS performance expectations, including the cross-disciplinary skills. Conversely, the TCCRS performance

expectations were not constructed with the goal or constraint that they all be assessable by means of existing admissions or placement tests. As such, lack of complete coverage of the TCCRS performance expectations does not imply that an existing test is not a high-quality assessment instrument.

The study ascertains (1) the extent to which the content assessed by each test aligns with the TCCRS performance expectations and (2) the unique characteristics of each test. Table 2 below is a general mapping of the test coverage based on the test specifications derived from information available on each test developer's website.

Table 2. Comparison of Coverage Between Test Content and TCCRS Content

	COMPASS	ASSET	ACT	ACCUPLACER	SAT	THEA
TCCRS Content	*ACT*	*ACT*	*ACT*	*College Board*	*College Board*	*Evaluation Systems (Pearson)*
Mathematics						
Numeric reasoning	√	√	√	√	√	√
Algebraic reasoning	√[1]	√[1]	√	√	√	√
Geometric reasoning	√	√	√	√	√	√
Measurement reasoning				√		√
Probabilistic reasoning			√[2]		√	
Statistical reasoning			√		√	
Functions	√	√	√	√	√	√
Problem solving and reasoning				√[3]		√
Communication and representation			√			√
Connections						
ELA						
Writing	√	√	√	√[4]	√	√
Reading	√	√	√	√	√	√
Research						
Cross-Disciplinary Skills						
Key cognitive strategies						
Foundational skills						

Notes: [1]For algebra, COMPASS includes pre-algebra, algebra, and college algebra while the ASSET measures elementary, intermediate, and college algebra. [2]ACT measures "understanding simple descriptive statistics." [3]ACCUPLACER measures applications and problem solving. [4]ACCUPLACER measures sentence skills.

The College Board, ACT, and the Evaluation Systems group of Pearson generously supplied EPIC with live, operational test items and—in some cases—provided verification of item rendering, reviews, and feedback on study findings. Table 3 describes the number of items provided for each test.

Table 3. Number of Test Items by Test and Subject

Test	Items Provided	Total Number of Mathematics Items		Total Number of ELA Items	
		Multiple choice	Constructed response	Multiple choice	Constructed response
ACT	Three forms	180	0	347	2
ACCUPLACER	Item pool	248	0	162	2
ASSET	Four forms	528	0	240	0
COMPASS	Item pool	351	0	240	4
SAT	Forms (ELA), representative item set (mathematics)	100	0	167	2
THEA	One form	53	0	82	1

Note: Constructed response items were writing prompts.

Although the ACCUPLACER consists of modular tests that may be presented in different combinations, the item pool was treated as representative of the ACCUPLACER test content for mathematics and ELA and the ACCUPLACER as a single test for each subject for analyses. The THEA is the only test represented by a single form composed of the actual number of items presented to students during an administration, so although one might expect the categorical concurrence estimates to be lower for THEA because it has the fewest test items, the reviewers found the THEA to be comparable to other tests in degree of categorical concurrence (see Table 13 on p. 29).[1]

Several components of the TCCRS (e.g., cross-disciplinary skills, research in ELA, and connections in mathematics) are not commonly included in test specifications. Also, few of these tests are designed to explicitly assess statistical, probabilistic, or measurement

[1] While categorical concurrence may be influenced by the number of test items reviewed for a given test, post hoc analyses suggest this was of minimal impact in the current study. The most likely explanation is that cases where additional items were reviewed resulted mainly in repeats of matches rather than new matches. Because test specifications should be comprehensively and accurately covered by the items contained in a single operational form and because all intact test forms and hand-picked item sets included in the current study were representative of the test specifications, it is likely that in all cases the number of items submitted was sufficient to gauge test coverage. Therefore, the findings or conclusions are not expected to be significantly different if the number of included items for any given test were increased above the number provided for the study.

reasoning. It is also worth noting that some of the applied or more complex skills can be difficult to assess via a multiple-choice item format and, therefore, are less likely to be measured by any test. Again, this does not imply a defect in any of the tests; rather it demonstrates that the TCCRS take a more comprehensive view of college readiness than has been the case historically. Given that college readiness standards are a relatively recent development and that these tests were created before the emergence of such standards, it would be quite surprising if any did align fully with the TCCRS. This study explores the extent of alignment without preconceptions of what constitutes *good* or *poor* alignment.

Content Expert Reviewers

Staff at EPIC recruited and trained extensively 12 content-area experts. All were currently active college faculty members at postsecondary institutions from around the United States at the time of the study. Most have contracted with EPIC for previous research projects and are familiar with the process of making item-alignment ratings and depth-of-knowledge judgments.

Training

The six ELA and six mathematics reviewers were trained in content-specific groups during an iterative process using sets of released sample items. This process, known as *convergent consensus*, is designed to create common mental maps among all reviewers regarding the content to be reviewed. With similar, agreed-upon conceptions of the content and with rules to resolve areas of potential ambiguity, reviewers utilize their professional expertise to make reliable, consistent judgments.

The experts convened remotely to review and discuss the TCCRS, the depth-of-knowledge categories, and the rigor definitions. First, they reviewed the TCCRS and a set of sample items individually. Then they met via teleconference to discuss their ratings and judgments. Through iterative discussion and practice applying the definitions to sample items, they identified and refined decision rules until they could consistently make ratings and alignment determinations.

As discrepancies arose, the group discussed them, reached a consensus, and added rules to resolve similar discrepancies in future ratings. A team leader was recruited from each group to facilitate consensus and to address content and alignment questions from reviewers. This process was repeated until reviewers agreed on their ratings of sample test sets. Only then were they provided access to the online tool containing the operational test items.

Process

Following training completion, the mathematics and ELA content reviewers accessed the test items via a secure online tool that collected their ratings and their alignment judgments. First, they rated the TCCRS performance expectations on rigor and cognitive demand. Second, they rated each of the test items—the order of presenting test items varied for each reviewer. Finally, they identified the performance expectations that each test item assessed.

Cognitive Demand

This study uses Marzano's taxonomy model to define *cognitive demand* as the level of information processing and the degree of conscious thought needed to complete a task (Marzano, 2001). The Marzano model was selected over Bloom's taxonomy because Bloom's does not appear to be a continuous scale to the same degree as the Marzano model. In Bloom's, the first stage, Knowledge, does not describe a state of cognitive functioning but rather a characteristic of the learning. Subsequent stages of Bloom's (e.g., Comprehension) shift to implied cognitive processing levels. But here again, the intervals do not seem to be continuous or clearly connected in a sequence. Moving from Comprehension to Application in Bloom's does not seem to reflect how learners function in practice, where the two steps appear to be much more intimately intertwined. The Marzano model offers the advantage of being based on the degree of cognitive processing necessary to address the academic task at hand and the degree to which both short-term and longer-term memory come into play to complete the task (or test item) successfully. Each level builds off of the prior one, and each requires a higher degree of cognitive processing than the previous one.

The first four levels in the taxonomy were used in the study: retrieval, comprehension, analysis, and knowledge utilization. The rating scale ranges as follows from 1 (lowest) to 4 (highest):

- **1 = Retrieval**: recognizing, recalling, and executing
- **2 = Comprehension**: integrating and symbolizing
- **3 = Analysis**: matching, classifying, analyzing errors, generalizing, and specifying
- **4 = Knowledge utilization**: decision making, problem solving, experimenting, and investigating

Rigor

Rigor differs from cognitive demand in that it focuses not on the mental activity required to answer an item successfully or to perform the expectation stated in the standards, but on the relative challenge and difficulty of doing so. Entry-level college student expectations function as the point of reference. The scale, which ranges from 1 (lowest) to 3 (highest), uses the following definitions:

- **1 = Below the level at which an entry-level college student should perform.** Students should have mastered this knowledge/skill in high school. An entry-level credit-bearing college course is taught with the assumption that students have already mastered this knowledge/skill.
- **2 = At the level at which an entry-level college student should perform.** Students may not have mastered this knowledge/skill in high school but have been introduced to this knowledge/skill at a level that will only require review in an entry-level college course. This knowledge/skill will be taught in an entry-level credit-bearing college course.
- **3 = Above the level at which an entry-level college student should perform.** Students would not be expected to master this knowledge/skill in an entry-level credit-bearing college course. This knowledge/skill will be taught in an upper-level college course in this subject area.

Data Collection

Reviewers began by rating the TCCRS on rigor and cognitive demand using the scales presented above. The TCCRS were rated at the performance-expectation level on cognitive demand and rigor for mathematics and ELA and describe 70 performance

expectations for mathematics and 34 for ELA.

For data collection, some of the more complex ELA performance expectations were disaggregated into multiple subexpectations to simplify and reduce potential ambiguity during the ratings and alignment review process. These were subsequently collapsed back into the original performance expectation formats for analysis purposes. To collapse the rigor and cognitive-demand ratings, the average was taken across subexpectations and the average of the ratings for each set became the rating for the original performance expectation. To collapse alignment judgments, the items that each of the subexpectations were aligned with were noted, and the original performance expectation were aligned to all of the items identified as being aligned to any of the subexpectations.

The final step in evaluating the tests was matching test items to the TCCRS. Reviewers identified areas of alignment between the TCCRS and the test items by matching each test item to the content area and cross-disciplinary TCCRS. Although reviewers were originally asked to indicate primary and partial alignment, it was noted that some reviewers had difficulty consistently making the distinction between primary and partial alignment and ultimately, all ratings were collapsed for final analysis.

Test items are grouped so that all items belonging to a single test form or pool of items are presented together, anonymously, and in random order to the reviewers. This grouping ensured that they were not unintentionally biased by preconceived perceptions of test quality or reputation while conducting their ratings. It also mitigated effects from item order and fatigue.

Data Analyses

The objective of this study is to provide a descriptive summary of the tests on measures relative to research objectives and not to make evaluative or general judgments about the quality of each test or to make independent evaluations of tests not directly relevant to this purpose. Other national studies of this nature report results in terms of basic descriptive statistics and do not use tests of statistical significance to quantify differences observed between tests. Although the current study reports means, it does

so to describe differences between tests in terms of their relative relationship to the TCCRS and, therefore, does not apply tests of significance to observed differences in percentages or means. This procedure is consistent with other alignment study results presentations. When this study uses “more” or “less” to define the extent of alignment, they describe relative differences in the relationships between tests and the TCCRS without making probabilistic or inferential judgments about the nature of those differences.

Computing Rigor and Cognitive Demand

Average rigor and cognitive-demand ratings for the TCCRS and for the test items describe the depth of knowledge necessary to meet the TCCRS and to correctly answer the test items. For the standards, averages were computed for the rigor and cognitive-demand ratings over the disaggregated ELA performance expectations for each reviewer, and then averaged across reviewers for each performance expectation. This results in overall performance expectation rigor and cognitive-demand scores and the difference between the test items and the performance expectations in average rigor and cognitive demand were computed. These differences describe rigor and cognitive-demand consistency. For test items, rigor and cognitive-demand scores were averaged across reviewers to get the overall item rigor and cognitive-demand scores.

Other alignment studies have also treated rigor and cognitive-demand measures as quantitative rather than categorical (Herman, Webb, and Zuniga, 2005). Because this study averaged across the disaggregated ELA performance expectations, the use of averages was carried through and both rigor and cognitive-demand scales were treated as continuous. Using means—not medians or modes—captured the reviewer’s intended ratings across the disaggregated performance expectations and more precisely described the differences between tests and standards in rigor and cognitive-demand ratings.

For the standards, the total number of unique items aligning to each performance expectation was computed by test and across test (counting each performance expectation only once even when it was identified by more than one reviewer). From

this, categorical concurrence was computed: when this number was six or larger, the test achieved *categorical concurrence* on that performance expectation. This criterion is based on accepted criteria used in similar national studies. The total number of matches was also identified (counting each item assessing a performance expectation every time it was identified, even when it was identified by more than one reviewer). This was used this to describe the range of knowledge assessed; when one or more items assessed a performance expectation, a relationship was noted and included in calculating the percent of performance expectations within an organizing component that were assessed by at least one item. The criterion for sufficient range is that at least one-half of the performance expectations within each organizing component have at least one item assessing it. Finally, the differences were computed in rigor and cognitive demand for the test items and the performance expectations they assessed.

Computing Alignment Criteria

The measures described above were used to determine alignment. These include:

- **Categorical concurrence:** the number of unique items identified across all reviewers as assessing each of the performance expectations (counting each item identified as measuring a performance expectation only once even when identified by multiple reviewers). The criterion for the modified categorical concurrence metric is that across reviewers a test has at least six unique items assessing each performance expectation.

- **Depth-of-knowledge (DOK) consistency:** is measured by comparing the average DOK required of the test item (as determined by the reviewer ratings) with the average DOK required to meet the standard (as determined by reviewer ratings). The recommended benchmark is that at least one-half the assessment items are at or above the DOK required by the corresponding standard. To maximize the information provided by reviewers, this approach was modified by computing the difference between the item rigor and cognitive demand and the assessed performance expectation rigor and cognitive demand, then averaging the differences across performance expectations to the organizing component level for each test and overall. The resulting statistic is the average difference in rigor or cognitive demand between test items and the performance expectations each item assesses.

- **Range of knowledge:** is measured as the percent of standards addressed by one or more items on each test. Also described are the numbers of items on each test for each performance expectation; this data is summarized across reviewers. The suggested benchmark is that a test should cover at least one-half

of the performance expectations described in the standards. In addition, the total number of matches for each performance expectation is provided to detail the coverage provided by each test.

Reviewer Agreement

In an assessment context in which expert reviewers evaluate student performance, questions about the reliability of ratings are paramount and are investigated using empirical evidence. In alignment studies, however, in which expert reviewers are used to evaluate assessment items against a matrix of standards and the ratings are used to compute various alignment indices, basic questions about rater reliability often are not addressed at all or are not fully addressed (Herman, Webb and Zuniga, 2007; D'Agostino, et al., 2008). Indeed, most alignment studies use between three and ten reviewers, but often there is little critical examination of the extent to which the ratings are generalizable and of which disagreements influence alignment (e.g., Achieve, Inc., 2007; Webb, 1997, 1999, and 2002; Porter, 2002).

In this alignment study, the ratings of six experts were used as the basis for alignment computations and decisions. Six is the standard number of reviewers required in similar alignment studies to obtain sufficient reliability (Herman, Webb and Zuniga, 2005; Webb 1997, 1999, and 2002). Consistent with the treatment of rigor ratings and cognitive demand ratings as quasi-quantitative measures (rather than as strictly categorical measures), a generalizability analysis was conducted with items and standards crossed by reviewers (Shavelson and Webb, 1991). Other measures of agreement are appropriate for categorical ratings (e.g., kappa coefficients, percent agreement, etc.).

Generalizability theory is particularly useful in this context, as it provides a model for disentangling and identifying the multiple sources of error that can influence the consistency of ratings. That is, generalizability theory provides us with the amount of error that is attributable to raters and describes the extent to which the ratings generalize beyond the individual raters to the intended construct domain. The error attributable to raters should be as small as possible. When it is not, it implies that ratings were not consistently made across raters.

Specifically, a model design with items crossed by reviewers (i X r design) and standards crossed by reviewers (s X r design) in which the sources of variation were treated as random was used. To measure the rigor and cognitive demand of items and standards, the items and standards were the objects of measurement and the reviewers were considered the sources of error (or *facet* in G-theory terminology). The generalizability study focused on reporting reliability for absolute decisions, as the primary interest in this study is identifying the absolute level of cognitive demand and rigor of an item or standard (a criterion-based decision), rather than ordering items or standards by rank in these scales (a relative decision). The *absolute error variance* indicates the consistency of item-and-standard ratings across reviewers. The phi coefficient, called the *index of dependability* (Shavelson and Webb, 1991), can be considered a reliability-like coefficient for absolute decisions (Herman, Webb and Zuniga, 2007; Mushquash and O'Connor, 2006; Thompson, 2003). The phi coefficient in this context represents decision consistency over parallel rating situations. For example, a phi coefficient of 0.80 indicates that, if the same study was recreated and repeated over multiple occasions, one could expect the same pattern of ratings 80% of the time. Coefficients are interpreted similarly to reliability coefficients in that values of 0.80 and higher indicate high generalizability.

Table 4 shows the generalizability results for the rigor and cognitive-demand ratings of the mathematics and English items across assessments. The phi coefficients for the cognitive-demand ratings are close to or above the conventional 0.80 criterion for reliability. The phi coefficients for the rigor ratings were lower than those for the cognitive-demand ratings, with none of the coefficients reaching the conventional criterion for reliability. These results indicate that the six reviewers did reach an acceptable level of dependability for estimating mathematics and ELA items' level of cognitive demand, but were much less consistent in their rating of the level of rigor.

Table 4. G-Study Coefficients for Mathematics and ELA Items across Test

Subject	Items	Cognitive Demand		Rigor	
		Phi Coefficients	Absolute Error Variance	Phi Coefficients	Absolute Error Variance
Mathematics	1,460	0.859	0.035	0.505	0.007
ELA	1,239	0.703	0.053	0.446	0.02

Table 5 shows the generalizability results for the cognitive demand ratings and rigor ratings of the mathematics and ELA TCCRS performance expectations. The phi coefficients for the cognitive-demand ratings are close to or above the conventional 0.80 criterion for reliability. The phi coefficients for the rigor ratings were lower than those for the cognitive demand ratings, with none of the coefficients reaching the conventional criterion for fully satisfactory reliability. These results indicate that the six reviewers did reach an acceptable level of dependability for estimating mathematics and ELA standards' level of cognitive demand but not their level of rigor.

Table 5. G-Study Coefficients for Mathematics and ELA TCCRS Performance Expectations Ratings

Subject	Standards	Cognitive Demand		Rigor	
		Phi Coefficients	Absolute Error Variance	Phi Coefficients	Absolute Error Variance
Mathematics	115	0.855	0.100	0.566	0.038
ELA	119	0.724	0.095	0.556	0.060

Overall, these results indicate higher rater reliability for mathematics item ratings and standard ratings than for ELA item ratings and standard ratings. Additionally, the results indicate higher rater reliability for cognitive-demand ratings than for rigor ratings. Results are consistent with findings from other similar studies using the same number of reviewers (Herman, Webb, and Zuniga, 2005, Brown and Conley, 2007, Brown and Niemi, 2007). Interestingly, Herman, Webb, and Zuniga also reported that ratings of cognitive demand were more reliable than were ratings of centrality (similar to rigor in that centrality evaluated the extent that a standard was essential to a topic). The observed reliability of raters is sufficient to meet the precision needed to meet the objectives of this study.

It is important to note that, in most cases, the relatively large variance components (not shown here) for the residual effects (Item X rater; Standard X rater) relative to the estimated variance components for items and standards suggests large interaction effects (i.e., reviewers rank-ordered items and standards differently on rigor and cognitive demand) or other sources of error variability not captured in the study design. Other sources of error variability could be a result of reviewers rating standards before items, raters receiving the items in a random order, reviewers conducting their ratings at

different times in different settings, and variations in individual experience with writing items and experience with alignment studies.

As part of the analysis a *D-study* (decision study) was also conducted, which determined the gains in reliability expected if the number of reviewers was increased in future studies. The results indicate that, in most cases, increasing the number of reviewers from 6 to 10–15 would result in only moderate gains in reliability (as measured by the phi coefficient).

Although higher levels of rater agreement are always better, in the context of the study's overall goals, these reliability statistics are adequate. From a validity perspective, the precision required in making any particular determination is a function of the consequences of the determination. If this study was designed to select a particular test as "best," higher reliabilities might be justified. However, in the context of establishing a general map of the relationship among *all* college placement and admission tests and the TCCRS, the rater reliabilities seem sufficient to make such an overall determination. It is worth noting that there is no evidence of any *systematic* rater bias that might threaten the general conclusions, only a higher degree of unexplained variation among all raters. Further indirect evidence that the effects of the lower than ideal reliability statistics did not substantially harm overall study conclusions is that test content coverage findings are consistent with the test specifications. In other words, overall, raters found the items to cover the same content areas that test makers said their tests covered.

Findings

Study findings are described below beginning with a summary of the rigor and cognitive demand of the TCCRS and the tests, including:

- Average rigor and cognitive demand of TCCRS organizing components
- Average rigor and cognitive demand of tests, across items

Also described is the alignment between the test items and the TCCRS, specifically:

- The total number of matches or *hits* for each performance expectation

- *Zero-match* performance expectations, or those not assessed by any of the tests
- *Categorical concurrence*, modified to describe when the number of items assessing a performance expectation on each test is six or more for mathematics and ELA tests
- Depth-of-knowledge consistency for mathematics and ELA tests, describing average differences in rigor and cognitive-demand ratings
- Range of knowledge for mathematics and ELA tests identifying the total number of matches for each performance expectation by test

Rigor and Cognitive Demand

Texas Career and College Readiness Standards Rigor and Cognitive Demand

Reviewers provided rigor and cognitive-demand ratings for each of the TCCRS performance expectations. Each reviewer's ratings were averaged across the expanded performance expectations and then averaged across reviewers to generate rigor and cognitive-demand scores for each item and then for each performance expectation.

Table 6 provides the average of reviewers' rigor and cognitive-demand ratings across performance expectation for each organizing component of the TCCRS cross-disciplinary skills. Note that the organizing components are at one level of aggregation higher than the performance expectations. On average, the reviewers found the cross-disciplinary skills to be at or below the level at which an entry-level college student should perform (between 1 and 2 on the rigor scale). Reviewers rate the key cognitive strategies at a higher level of rigor and cognitive demand than the foundational skills. Note the similar patterns in findings between rigor and cognitive demand; however, given the higher reliability of the cognitive demand ratings, somewhat greater consideration should be given to cognitive demand ratings than to rigor ratings.

Table 6. Average Rigor and Cognitive Demand for Cross-Disciplinary Skills by Organizing Component

Organizing Component	Average Rigor (3-point scale)			Average Cognitive Demand (4-point scale)		
	Mean	***N***	**SD**	**Mean**	***N***	**SD**
Key Cognitive Strategies						
Intellectual curiosity	2.04	2	0.177	3.29	2	0.059
Reasoning	1.92	4	0.180	3.35	4	0.299
Problem solving	1.89	3	0.192	3.33	3	0.220

Organizing Component	Average Rigor (3-point scale)			Average Cognitive Demand (4-point scale)		
	Mean	***N***	**SD**	**Mean**	***N***	**SD**
Academic behaviors	1.40	4	0.125	2.38	4	0.285
Work habits	1.13	2	0.059	2.46	2	0.059
Academic integrity	1.60	4	0.197	2.58	4	0.642
Overall Key Cognitive Strategies Mean	**1.67**	**19**	**0.329**	**2.88**	**19**	**0.549**
Foundational Skills						
Reading across the curriculum	1.23	8	0.165	2.05	8	0.478
Writing across the curriculum	1.14	3	0.127	2.00	3	0.500
Research across the curriculum	1.59	8	0.225	2.59	8	0.384
Use of data	1.81	3	0.268	2.94	3	0.459
Technology	1.29	4	0.144	1.96	4	0.567
Overall Foundational Skills Mean	**1.41**	**26**	**0.287**	**2.30**	**26**	**0.554**

Note: Averages were computed for each performance expectation across reviewers and then were averaged across performance expectations within each organizing component. "N" refers to the number of performance expectations within each organizing component. The standard deviations (SD) describe the variability of the performance expectations within organizing components. Shaded cells indicate the organizing components with the highest average rigor or cognitive demand ratings.

The cross-disciplinary skills with the highest rigor ratings are the same as those with the highest cognitive-demand ratings:

- Intellectual curiosity
- Reasoning
- Problem solving
- Use of data

Within the cross-disciplinary skills, the key cognitive strategies were on average, more rigorous and cognitively demanding than the foundational skills.

Table 7 provides the average of reviewers' rigor and cognitive-demand ratings across performance expectations for each of the mathematics organizing components. The rigor ratings are slightly lower for mathematics than for the cross-disciplinary skills. On average, the reviewers rated the mathematics standards as below the level at which an entry-level college student should be expected to perform (near 1 on the rigor scale).

Table 7. Average Rigor and Cognitive Demand for Mathematics by Organizing Component

Organizing Component	Average Rigor (3-point scale)			Average Cognitive Demand (4-point scale)		
	Mean	***N***	**SD**	**Mean**	***N***	**SD**
Numeric Reasoning						
Number representation	1.08	2	0.118	1.00	2	0.000
Number operations	1.17	1		1.00	1	
Number sense and number concepts	1.00	1		1.83	1	
Overall Numeric Reasoning	**1.08**	**4**	**0.096**	**1.21**	**4**	**0.417**
Algebraic Reasoning						
Expressions and equations	1.17	1		1.67	1	
Manipulating expression	1.00	1		1.17	1	
Solving equations, inequalities, and systems of equations	1.08	2	0.118	1.58	2	0.589
Representations	1.08	2	0.118	2.00	2	0.000
Overall Algebraic Reasoning	**1.08**	**6**	**0.091**	**1.67**	**6**	**0.408**
Geometric Reasoning						
Figures and their properties	1.11	3	0.192	1.78	3	1.072
Transformations and symmetry	1.11	3	0.192	1.61	3	0.770
Connections between geometry and other mathematical content strands	1.17	3	0.167	1.83	3	0.167
Logic and reasoning in geometry	1.17	2	0.000	2.42	2	0.825
Overall Geometric Reasoning	**1.14**	**11**	**0.146**	**1.86**	**11**	**0.710**
Measurement Reasoning						
Measurement involving physical and natural attributes	1.00	1		1.17	1	
Systems of measurement	1.00	2	0.000	1.00	2	0.000
Measurement involving geometry and algebra	1.06	3	0.096	1.22	3	0.385
Measurement involving statistics and probability	1.25	2	0.118	1.92	2	1.296
Overall Measurement Reasoning	**1.08**	**8**	**0.126**	**1.33**	**8**	**0.649**
Probabilistic Reasoning						
Counting principles	1.17	1		1.17	1	
Computation and interpretation of probabilities	1.33	2	0.236	1.50	2	0.471
Overall Probabilistic Reasoning	**1.28**	**3**	**0.192**	**1.39**	**3**	**0.385**
Statistical Reasoning						
Data collection	1.67	1		2.50	1	
Describe data	1.04	4	0.083	1.54	4	0.479
Read, analyze, interpret, and draw conclusions from data	1.50	4	0.136	2.67	4	0.304
Overall Statistical Reasoning	**1.31**	**9**	**0.282**	**2.15**	**9**	**0.674**
Functions						
Recognition and representation of functions	1.00	2	0.000	1.17	2	0.236
Analysis of functions	1.08	2	0.118	2.25	2	0.589
Model real world situations with functions	1.33	2	0.471	2.33	2	0.707

Organizing Component	Average Rigor (3-point scale)			Average Cognitive Demand (4-point scale)		
	Mean	***N***	**SD**	**Mean**	***N***	**SD**
Overall Functions	**1.14**	**6**	**0.267**	**1.92**	**6**	**0.721**
Problem Solving and Reasoning						
Mathematical problem solving	1.30	5	0.139	3.10	5	0.418
Logical reasoning	1.50	2	0.236	3.50	2	0.471
Real world problem solving	1.33	3	0.167	2.83	3	0.601
Overall Problem Solving and Reasoning	**1.35**	**10**	**0.166**	**3.10**	**10**	**0.492**
Connections						
Connections among the strands of mathematics	1.25	2	0.118	2.67	2	0.000
Connections of mathematics to nature, real-world situations, and everyday life	1.50	3	0.167	2.50	3	0.167
Overall Connections	**1.40**	**5**	**0.190**	**2.57**	**5**	**0.149**
Communication and Representation						
Language, terms, and symbols of mathematics	1.06	3	0.096	2.22	3	0.674
Interpretation of mathematical work	1.25	2	0.118	2.25	2	0.354
Presentation and representation of mathematical work	1.33	3	0.167	2.61	3	0.509
Overall Communication and Representation	**1.21**	**8**	**0.173**	**2.38**	**8**	**0.510**

Note: Averages were computed for each performance expectation across reviewers and then were averaged across performance expectations within each organizing component. "N" refers to the number of performance expectations within each organizing component. The standard deviations (SD) describe the variability of the performance expectations within organizing components. Shaded cells indicate the organizing components with the highest average rigor or cognitive demand ratings.

The organizing components with the highest average cognitive demand ratings belong to the statistical reasoning, problem solving and reasoning, and statistical reasoning key content areas, including the connections and problem solving and reasoning, data collection, read, analyze, interpret, and draw conclusions from data, logical reasoning, and connections of mathematics to nature, real-world situations, and everyday life organizing components. The organizing components with the highest cognitive demand ratings tend also to be high in rigor.

The performance expectations with the highest rigor include:

- All of the problem solving and reasoning expectations (logical reasoning, mathematical problem solving, and real-world problem solving).
- Two of the three statistical reasoning expectations (read, analyze, interpret, draw conclusions from data, and data collection).
- All of the connections expectations, including among strands of mathematics and connections of mathematics to real-world situations and everyday life.

- Presentation and representation of mathematical work.

Table 8 provides the average of reviewers' rigor and cognitive-demand ratings across performance expectations for each of the ELA organizing components. On average, the ELA standards are at the level an entry-level college student should perform (close to 2 on the rigor scale).

Table 8. Average Rigor and Cognitive Demand for English/Language Arts by Organizing Component

Organizing Component	Average Rigor			Average Cognitive Demand		
	Mean	***N***	**SD**	**Mean**	***N***	**SD**
Writing						
Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose	1.83	5	0.199	2.42	5	0.391
Overall Writing	**1.83**	**5**	**0.199**	**2.42**	**5**	**0.391**
Reading						
Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths	1.59	11	0.277	2.35	11	0.490
Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing	1.22	3	0.096	1.50	3	0.333
Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods	1.83	4	0.381	2.51	4	0.790
Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances	1.92	2	0.589	2.75	2	0.825
Overall Reading	**1.62**	**20**	**0.355**	**2.30**	**20**	**0.637**
Research						
Formulate topic and questions	1.53	3	0.127	2.47	3	0.173
Select information from a variety of sources	1.81	4	0.336	2.60	4	0.448
Produce and design a document	1.75	2	0.118	2.71	2	0.059
Overall Research	**1.70**	**9**	**0.257**	**2.58**	**9**	**0.303**

Note: Averages were computed for each performance expectation across reviewers and then were averaged across performance expectations within each organizing component. Standard deviations describe the variability of the performance expectations within organizing components. Shaded cells indicate the organizing components with the highest average rigor or cognitive demand ratings.

For ELA, writing and research are rated as more rigorous and cognitively demanding than reading, and the average rigor and cognitive demand for the ELA organizing components are higher than for the mathematics and the cross-disciplinary skill organizing components. The ELA performance expectations with the highest rigor include:

- Explaining how literary and other texts evoke personal experience and reveal character in particular historical circumstances
- Describing, analyzing, and evaluating information within and across literary and other texts from a variety of cultural and historical periods
- Select information from a variety of sources and produce and design a document

Test Rigor and Cognitive Demand

The reviewers found tests overall to be quite similar in their level of rigor, which on average was below the level of the TCCRS and below the level at which an entry-level college student should perform. This should not come as a surprise because admissions and placement tests must cover a range of knowledge and skill levels to uncover test takers who are below the level of a credit-bearing college course. To do so requires at least some items that are below college level. This explains why, in most cases, the average test items were less rigorous than the standards.

Table 9 describes the average rigor ratings for each of the tests by subject. As with the TCCRS, the rigor ratings are higher for ELA than for mathematics. The THEA, ACCUPLACER, and SAT had the highest rigor rating averages across all items on all ELA tests. In interpreting results, more weight should be given to cognitive demand than to rigor due to the higher reliability in cognitive-demand ratings.

Table 9. Average Rigor for Mathematics and English/Language Arts by Test

Test	Average Mathematics-Item Rigor (Averaged across rater and items)			Average ELA-Item Rigor (Averaged across rater and items)		
	Mean	*N*	SD	Mean	*N*	SD
ACCUPLACER	1.08	248	0.139	1.21	162	0.142
ACT	1.03	180	0.098	1.16	347	0.179
ASSET	1.02	528	0.070	1.08	240	0.110
COMPASS	1.06	351	0.146	1.08	240	0.158
SAT	1.08	100	0.124	1.21	167	0.178
THEA	1.05	53	0.107	1.26	83	0.190

Note: The medians for the test item ratings are described in Appendix E.

There is greater variability in the overall cognitive-demand ratings. Reviewers rate the cognitive demand for mathematics tests higher than for ELA tests. The mathematics tests with the highest averages are the SAT, ACT, and THEA. The ELA tests with the

highest averages are the ACCUPLACER and the THEA. Table 10 describes the average cognitive-demand ratings for each test by subject.

Table 10. Average Cognitive Demand for Mathematics and English/Language Arts by Test

Test	Average Mathematics Item Cognitive Demand (Averaged across rater and item)			Average ELA Item Cognitive Demand (Averaged across rater and item)		
	Mean	*N*	SD	Mean	*N*	SD
ACCUPLACER	1.39	248	0.376	1.64	162	0.352
ACT	1.84	180	0.487	1.37	347	0.427
ASSET	1.50	528	0.502	1.28	240	0.341
COMPASS	1.56	351	0.475	1.42	240	0.389
SAT	2.05	100	0.369	1.46	167	0.42
THEA	1.73	53	0.463	1.59	83	0.421

Note: The distributions and medians are described in Appendix E.

Within the ELA tests, the constructed-response writing prompts received higher rigor and cognitive demand ratings than did the multiple-choice reading items (with some variability by test: 100% of the raters indicated the SAT, COMPASS, and ACT prompts were at the level of rigor expected of a first-year college student, while averaged across the ACCUPLACER prompts, 40 percent reported the same. These were also more cognitively demanding and were the only items to consistently require the highest level of cognitive demand.

Alignment Between Test Items and TCCRS

Test Coverage of TCCRS

Reviewers identified a total of 57,391 *hits* or matches between the 2,699 test items and the 149 TCCRS performance expectations. As expected, the test items assessed multiple standards, ranging from 15 (ASSET ELA) to 34 (SAT Mathematics). Raters identified more matches for mathematics items than for ELA items across test (28 versus 17). Across tests, the average number of matches per test item ranged from 18 to 34 for mathematics and from 15 to 18 for ELA. The mathematics tests with the highest average number of matches per item were the SAT, ACT, and THEA.

Most- and Least-Assessed TCCRS Organizing Components

Table 11 describes the number of times the reviewers identified an item (across all

tests) that assessed a performance expectation within each of the organizing components and key content areas. The most hits occurred for the key content areas of writing, problem solving and reasoning, algebraic reasoning, and foundational skills. The standards with the fewest test items assessing them are research, probabilistic reasoning, and statistical reasoning.

Table 11. Total Number of Hits per Key Content Area for Mathematics, ELA, and the Cross-Disciplinary Skills

Key Content	Total Number of Hits (Alignment of a test item to a performance expectation)	Percent of all Hits
Mathematics		
Numeric reasoning	3,603	6%
Algebraic reasoning	7,809	14%
Geometric reasoning	5,117	9%
Measurement reasoning	1,361	2%
Probabilistic reasoning	113	0%
Statistical reasoning	282	0%
Functions	1,656	3%
Problem solving and reasoning	8,236	14%
Communication and representation	2,866	5%
Connections	1,202	2%
ELA		
Writing	8,829	15%
Reading	3,659	6%
Research	12	0%
Foundational Skills		
Key cognitive strategies	5,670	10%
Foundational skills	6,991	12%

Note: Percents may not sum to 100 percent due to rounding. Number of hits are based on six raters for mathematics and ELA standards and are based on all 12 for foundational skills because the foundational skills applied to both mathematics and ELA, all reviewers).

Zero-Match Expectations

Expectations not assessed by any test are called *zero-match* performance expectations. Table 12 identifies the TCCRS items not assessed by a single test item on any of the tests.

Table 12. Zero-Match TCCRS Performance Expectations

Key Content	Organizing Components	Performance Expectation Not Assessed by a Single Test Item
Mathematics: Statistical Reasoning	A. Data collection	1. Plan a study.
	C. Read, analyze, interpret, and draw conclusions from data	3. Analyze relationships between paired data using spreadsheets, graphing calculators, or statistical software
		4. Recognize reliability of statistical results
ELA: Reading	A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths	8. Compare and analyze how generic features are used across texts
	B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing	2. Apply knowledge of roots and affixes to infer the meanings of new words
		3. Use reference guides to confirm the meanings of new words or concepts
	C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods	1. Read a wide variety of texts from American, European, and world literatures
		3. Analyze works of literature for what they suggest about the historical period and cultural contexts in which they were written
	D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances	2. Analyze the influence of myths, folktales, fables, and classical literature from a variety of world cultures on later literature and film
ELA: Research	A. Formulate topic and questions	1. Formulate research questions
		2. Explore a research topic
		3. Refine research topic and devise a timeline for completing work
	B. Select information from a variety of sources	4. Use source material ethically
	C. Produce and design a document	1. Design and present an effective product
		2. Use source material ethically

Note: The TCCRS include "Use source material ethically" in both the select information from a variety of sources and produce and design a document organizing components.

Many of these appear to be skills best assessed by means other than multiple-choice or even constructed-response type test items: plan a study, use reference guides to confirm the meanings of new words, formulate research questions, explore a research topic, use source material ethically, etc. These are not included as in subsequent descriptive tables. However, they are counted when computing measures where the total number of performance expectations is a denominator, such as with categorical concurrence.

Categorical Concurrence

Categorical concurrence describes the degree to which the items in a test correspond

with one or more of the TCCRS. The criterion of categorical concurrence is met if the same categories of content appear in both the assessment and the standards. To produce an acceptable level of reliability for assessment scores, Webb recommends that at least six items assess each performance expectation. Table 13 describes the percent of performance expectations demonstrating categorical concurrence across rater (i.e., that have at least six items assessing that performance expectation) within each organizing component for each mathematics test.

Table 13. Categorical Concurrence by Key Content for Mathematics Tests

Key Content	Organizing Component (Number of performance expectations)	Percent of Performance Expectations that Reached Categorical Concurrence for this Test in Mathematics					
		ACT	ACCU-PLACER	ASSET	COM-PASS	SAT	THEA
Numeric Reasoning	A. Number representation (2)	50%	50%	100%	50%	50%	0%
	B. Number operations (1)	100%	100%	100%	100%	100%	100%
	C. Number sense and number concepts (1)	100%	100%	100%	100%	0%	0%
	Numeric Reasoning Overall	**83%**	**83%**	**100%**	**83%**	**50%**	**33%**
Algebraic Reasoning	A. Expressions and equations (1)	100%	100%	100%	100%	100%	0%
	B. Manipulating expression (1)	100%	100%	100%	100%	100%	100%
	C. Solving equations, inequalities, and systems of equations (2)	50%	100%	100%	100%	100%	50%
	D. Representations (2)	100%	100%	100%	100%	100%	100%
	Algebraic Reasoning Overall	**88%**	**100%**	**100%**	**100%**	**100%**	**63%**
Geometric Reasoning	A. Figures and their properties (2)	100%	100%	100%	100%	66%	66%
	B. Transformations and symmetry (3)	66%	0%	33%	33%	33%	0%
	C. Connections between geometry and other mathematical content strands (3)	66%	66%	66%	66%	66%	66%
	D. Logic and reasoning in geometry (2)	100%	0%	100%	100%	0%	0%
	Geometric Reasoning Overall	**83%**	**42%**	**75%**	**75%**	**41%**	**33%**
Measurement Reasoning	A. Measurement involving physical and natural attributes (1)	0%	100%	0%	0%	0%	0%
	B. Systems of measurement (2)	50%	0%	100%	0%	0%	0%
	C. Measurement involving geometry and algebra (3)	66%	66%	66%	100%	66%	0%
	D. Measurement involving statistics and probability (2)	0%	0%	0%	0%	0%	0%
	Measurement Reasoning Overall	**29%**	**42%**	**42%**	**25%**	**17%**	**0%**
Probabilistic Reasoning	A. Counting principles (1)	0%	0%	0%	0%	100%	0%
	B. Computation and interpretation of probabilities (2)	0%	0%	0%	0%	0%	0%

Key Content	Organizing Component (Number of performance expectations)	Percent of Performance Expectations that Reached Categorical Concurrence for this Test in Mathematics					
		ACT	ACCU-PLACER	ASSET	COM-PASS	SAT	THEA
	Probabilistic Reasoning Overall	**0%**	**0%**	**0%**	**0%**	**50%**	**0%**
Statistical Reasoning	A. Data collection (1)	0%	0%	0%	0%	0%	0%
	B. Describe data (4)	25%	0%	25%	25%	100%	0%
	C. Read, analyze, interpret, and draw conclusions from data (4)	0%	0%	0%	0%	25%	0%
	Statistical Reasoning Overall	**13%**	**0%**	**13%**	**13%**	**63%**	**0%**
Functions	A. Recognition and representation of functions (2)	0%	50%	50%	50%	0%	0%
	B. Analysis of functions (2)	100%	100%	100%	100%	100%	50%
	C. Model real world situations with functions (2)	100%	50%	50%	100%	100%	100%
	Functions Overall	**67%**	**67%**	**67%**	**83%**	**67%**	**50%**
Problem Solving and Reasoning	A. Mathematical problem solving (5)	80%	80%	80%	80%	80%	80%
	B. Logical reasoning (2)	50%	0%	50%	50%	50%	50%
	C. Real world problem solving (3)	100%	33%	33%	33%	33%	33%
	Problem Solving and Reasoning Overall	**77%**	**38%**	**54%**	**54%**	**54%**	**54%**
Communication and Representation	A. Language, terms, and symbols of mathematics (3)	100%	66%	100%	100%	66%	66%
	B. Interpretation of mathematical work (2)	100%	50%	50%	100%	50%	100%
	C. Presentation and representation of mathematical work (3)	0%	0%	33%	33%	33%	33%
	Communication and Representation Overall	**67%**	**39%**	**61%**	**78%**	**50%**	**66%**
Connections	A. Connections among the strands of mathematics (2)	100%	50%	50%	50%	50%	50%
	B. Connections of mathematics to nature, real-world situations, and everyday life (3)	66%	33%	33%	33%	33%	33%
	Connections Overall	**83%**	**42%**	**42%**	**42%**	**42%**	**42%**
Key Cognitive Strategies	A. Intellectual curiosity (2)	0%	0%	0%	0%	0%	0%
	B. Reasoning (4)	0%	0%	0%	0%	0%	0%
	C. Problem solving (3)	66%	66%	66%	33%	33%	66%
	D. Academic behaviors (4)	0%	0%	0%	0%	0%	0%
	E. Work habits (2)	0%	0%	0%	0%	0%	0%
	F. Academic Integrity (4)	0%	0%	0%	0%	0%	0%
	Key Cognitive Strategies Overall	**11%**	**11%**	**11%**	**6%**	**6%**	**11%**
Foundational Skills	A. Reading across the curriculum (8)	12%	12%	25%	12%	12%	12%
	B. Writing across the curriculum (3)	0%	0%	0%	0%	0%	0%
	C. Research across the curriculum (8)	0%	0%	0%	0%	0%	0%

Key Content	Organizing Component (Number of performance expectations)	Percent of Performance Expectations that Reached Categorical Concurrence for this Test in Mathematics					
		ACT	ACCU-PLACER	ASSET	COM-PASS	SAT	THEA
	D. Use of data (3)	0%	0%	0%	0%	0%	0%
	E. Technology (4)	0%	0%	0%	0%	0%	0%
	Foundational Skills Overall	**2%**	**2%**	**5%**	**2%**	**2%**	**2%**
Overall	**Average % categorical concurrence**	**50%**	**39%**	**48%**	**47%**	**45%**	**30%**

Note: Average percent categorical concurrence by test computed as the average of the percents across organizing components. Categorical concurrence is defined as a test having six or more unique test items assessing a performance expectation and the percents shown are the percent of performance expectations within an organizing component that attained categorical concurrence for each test. Shaded cells indicate the recommended benchmark was met.

Reviewers of the mathematics TCCRS found categorical concurrence highest across all tests for algebraic reasoning, functions, and numeric reasoning components and lowest for the foundational skills. All tests attained categorical concurrence in algebraic reasoning, functions and communications and representations. Most tests attained categorical concurrence in the problem solving and reasoning and the communication and representation areas except for the ACCUPLACER test and all but the THEA attained categorical concurrence in numeric reasoning. Across all tests, the lowest categorical concurrence was observed in probabilistic reasoning, statistical reasoning (except the SAT), and the cross-disciplinary skills (with the exception of the problem solving and, to a lesser extent, reading across the curriculum expectations, which were moderately assessed by the tests).

The highest rates of categorical concurrence in mathematics are on the ACT, ASSET, COMPASS, and SAT tests, with unique strengths observed as follows:

- The ACT provided strong coverage in connections and problem solving and reasoning
- Although they fell below the 50% criteria, the ACCUPLACER and ASSET demonstrated stronger categorical concurrence in measurement reasoning than did the other tests
- ASSET provided more coverage of numeric reasoning overall, and reading across the curriculum than did other tests
- The SAT was the only test to reach categorical concurrence in probabilistic and statistical reasoning

Although some tests have unique strengths, results are somewhat consistent across tests: organizing components low in categorical concurrence tend to be low across all tests, organizing components high in categorical concurrence tend to be high across all tests. This suggests that, with minor gaps or areas of unique coverage, the placement and admissions tests provide similar content coverage relative to the TCCRS.

Table 14 describes the percent of performance expectations within each organizing component for which categorical concurrence was established for each English / language arts test. For the English / language arts TCCRS, categorical concurrence is higher for writing than for the foundational skills and reading. It is lowest for research.

Table 14. Categorical Concurrence by Key Content for English/Language Arts Tests

Key Content	Organizing Component	Percent of Performance Expectations that Reached Categorical Concurrence for this Test in ELA					
		ACT	ACCU-PLACER	ASSET	COM-PASS	SAT	THEA
Writing	I.A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose. (5)	80%	100%	100%	100%	80%	80%
	Writing Overall	**80%**	**100%**	**100%**	**100%**	**80%**	**80%**
Reading	II.A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths. (11)	73%	55%	46%	46%	46%	46%
	II.B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing. (3)	33%	0%	33%	33%	33%	33%
	II.C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods. (4)	25%	0%	0%	0%	0%	0%
	II.D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances.	0%	0%	0%	0%	0%	0%
	Reading Overall	**33%**	**14%**	**20%**	**20%**	**20%**	**20%**
Research	V.B. Select information from a variety of sources. (4)	0%	0%	0%	0%	0%	0%
	Research Overall	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Key Cognitive Strategies	A. Intellectual curiosity (2)	0%	0%	0%	0%	0%	0%
	B. Reasoning (4)	25%	25%	0%	25%	25%	25%
	C. Problem solving (3)	33%	33%	33%	33%	33%	33%
	D. Academic behaviors (4)	25%	25%	25%	50%	25%	25%
	E. Work habits (2)	0%	0%	0%	0%	0%	0%
	F. Academic integrity (4)	0%	0%	0%	0%	0%	0%
	Key Cognitive Strategies Overall	**14%**	**14%**	**10%**	**18%**	**14%**	**14%**
Foundational Skills	A. Reading across the curriculum (8)	75%	50%	63%	63%	63%	63%
	B. Writing across the curriculum (3)	66%	66%	66%	66%	66%	66%
	C. Research across the curriculum (8)	0%	0%	0%	0%	0%	0%
	D. Use of data (3)	0%	0%	0%	0%	0%	0%
	E. Technology (4)	0%	0%	0%	0%	0%	0%
	Foundational Skills Overall	**28%**	**23%**	**26%**	**26%**	**26%**	**26%**
Overall	**Average % categorical concurrence**	**31%**	**30%**	**31%**	**33%**	**28%**	**28%**

Note: Average percent categorical concurrence by test is computed as the average of the percents across organizing components. The percents described are the percent of performance expectations within an organizing component that attained categorical concurrence. Shaded cells indicate the meeting of the recommended benchmark of at least six items per test assessing each performance expectation.

Within the key content areas for reading, one organizing component accounts for nearly all of the categorical concurrence observed: locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths. Within the foundational skills, all tests demonstrate categorical concurrence on the reading and writing across the curriculum organizing components, but no tests demonstrate categorical concurrence with any other organizing component within this key content area. Within key content area, the highest categorical concurrence is achieved by the ACT for reading, and the ACCUPLACER, ASSET, and COMPASS for writing.

As with mathematics, the organizing components that are lower in categorical concurrence trend lower across all tests, and organizing components higher in categorical concurrence trend higher across all tests, indicating that content coverage is similar across tests.

Depth-of-Knowledge Consistency

To determine the relationship of rigor and cognitive demand between test-items and the TCCRS, the differences between items and performance-expectation rigor and cognitive-demand rating was computed for all matches. Table 15 summarizes the differences between the test items and the performance expectations.

Table 15. Average Differences Between Test-Item Rigor and Cognitive Demand and the Rigor and Cognitive Demand of the Performance Expectations they Assess

	Matches Between Test Items and Performance Expectations	**Average Difference in Cognitive Demand** (item cognitive demand minus performance-expectation cognitive demand)		**Average Difference in Rigor** (item rigor minus performance-expectation rigor)	
Test	**Number**	**Mean**	**SD**	**Mean**	**SD**
Mathematics					
ACCUPLACER	4,571	-0.38	0.787	-0.10	0.263
ACT	5,965	-0.18	0.805	-0.17	0.228
ASSET	12,592	-0.25	0.800	-0.16	0.215
COMPASS	9,543	-0.36	0.806	-0.12	0.244
SAT	3,409	-0.16	0.780	-0.13	0.232
THEA	1,622	-0.44	0.767	-0.15	0.243

	Matches Between Test Items and Performance Expectations	Average Difference in Cognitive Demand (item cognitive demand minus performance-expectation cognitive demand)		Average Difference in Rigor (item rigor minus performance-expectation rigor)	
Test	**Number**	**Mean**	**SD**	**Mean**	**SD**
English					
ACCUPLACER	2,720	-0.54	0.518	-0.33	0.330
ACT	5,676	-0.73	0.579	-0.31	0.340
ASSET	3,566	-0.82	0.538	-0.40	0.310
COMPASS	3,497	-0.64	0.583	-0.38	0.325
SAT	2,882	-0.67	0.596	-0.28	0.337
THEA	1,348	-0.56	0.561	-0.23	0.339
Overall Total	**57,391**	**-0.42**	**0.756**	**-0.21**	**0.287**

Note: Average differences are the average of the individual differences between test items and performance expectations for all matches identified on each test. Negative means indicate that on average, the reviewers rated the test items lower in cognitive demand or rigor than the performance expectations they assessed.

The difference between standards and test items in cognitive demand and rigor is larger for ELA tests than for mathematics tests. The differences are negative in most cases because the performance expectations are more rigorous and cognitively demanding than the test items, as is expected due to the range of rigor required by the tests to assess a range of student proficiency. The smaller differences indicate closer correspondence between the test items and their performance expectations.

The tests with the smallest gap in overall correspondence (indicated by the smallest average differences) in cognitive demand between test items and the performance expectations are the SAT and ACT for mathematics and the ACCUPLACER and THEA for ELA. For mathematics, all tests were rated similarly in terms of rigor; for ELA, the tests with the smallest gap in overall correspondence in rigor between test items and the performance expectations are the THEA and SAT for ELA.

Appendix B provides averages for each test at the organizing-component level. It shows the greatest disparity for mathematics in key cognitive strategies, connections, problem solving and reasoning, and the foundational skills. For ELA, the greatest rigor disparity is in writing, reading and key cognitive strategies. In these cases, the test items are below the rigor level of the performance expectations.

While on average, the standards were more rigorous than the test items, this was not the case with all performance expectations. For rigor in mathematics, test items rank higher than the TCCRS in the following categories:

- Numeric reasoning
    - Number representation
    - Number sense and concepts
- Algebraic reasoning
    - Manipulating expressions
    - Solving equations, inequalities, and systems of equations
- Measurement reasoning
    - Measurement involving physical and natural attributes
    - Systems of measurement
- Functions
    - Recognition and representation of functions
    - Analysis of functions
- Communication and representation
    - Language, terms, and symbols of mathematics

For ELA, the only performance expectation that is rated lower in rigor than assessment items is writing.

In cognitive demand for both mathematics and ELA, the TCCRS are more challenging on average than are the test items. The exceptions to this, where test items are more challenging, are:

- Numeric reasoning
    - Number representation
    - Number operations
- Algebraic reasoning

    - Manipulating expressions
    - Solving equations, inequalities, and systems of equations
    - Representations
- Measurement reasoning
    - Measurement involving physical and natural attributes
    - Systems of measurement
    - Measurement involving geometry and algebra
- Probabilistic reasoning
    - Counting principles
    - Computation and interpretation of probabilities
- Functions
    - Recognition and representation of functions

Overall, then, the TCCRS are more rigorous and demanding than the corresponding test items, except specific mathematics performance expectations as indicated above.

Range of Knowledge

In addition to categorical concurrence, the alignment between the TCCRS and the assessments are described using range of knowledge. The range of knowledge correspondence criterion examines the alignment of assessment items to expectations within the TCCRS. It describes how a breadth of knowledge the standards expect of students corresponds to knowledge needed to correctly answer test items. Range of knowledge is calculated as the percent of organizing components that have at least one item assessing each performance expectation. This is summarized across reviewers, and the suggested benchmark is for a test to have one or more items assess at least half of the performance expectations within an organizing component.

Table 16 describes the percent of performance expectations that are assessed by at least one mathematics test item (summed across all reviewers). Recall that each test item assesses more than one performance expectation. On average, across all key

content, the mathematics tests covered between 58 to 81 percent of the content described by the TCCRS.

Table 16. Range of Knowledge (Using Total Number of Matches) by Mathematics Test

Key Content	Organizing Component	Percent of Mathematics Performance Expectations Assessed By At Least One Test Item					
		ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
Numeric Reasoning	A. Number representation	100%	100%	100%	100%	100%	50%
	B. Number operations	100%	100%	100%	100%	100%	100%
	C. Number sense and number concepts	100%	100%	100%	100%	100%	100%
	Numeric reasoning Overall	**100%**	**100%**	**100%**	**100%**	**100%**	**83%**
Algebraic Reasoning	A. Expressions and equations	100%	100%	100%	100%	100%	100%
	B. Manipulating expression	100%	100%	100%	100%	100%	100%
	C. Solving equations, inequalities, and systems of equations	100%	100%	100%	100%	100%	50%
	D. Representations	100%	100%	100%	100%	100%	100%
	Algebraic Reasoning Overall	**100%**	**100%**	**100%**	**100%**	**100%**	**88%**
Geometric Reasoning	A. Figures and their properties	100%	100%	100%	100%	100%	100%
	B. Transformations and symmetry	100%	67%	33%	33%	100%	33%
	C. Connections between geometry and other mathematical content strands	66%	66%	66%	66%	100%	66%
	D. Logic and reasoning in geometry	100%	0%	100%	100%	100%	100%
	Geometric Reasoning Overall	**92%**	**58%**	**75%**	**75%**	**100%**	**75%**
Measurement Reasoning	A. Measurement involving physical and natural attributes	100%	67%	66%	100%	100%	100%
	B. Systems of measurement	100%	100%	100%	100%	100%	100%
	C. Measurement involving geometry and algebra	100%	67%	67%	100%	100%	100%
	D. Measurement involving statistics and probability	50%	0%	0%	0%	50%	50%
	Measurement Reasoning Overall	**88%**	**58%**	**58%**	**75%**	**88%**	**88%**
Probabilistic Reasoning	A. Counting principles	100%	100%	100%	100%	100%	0%
	B. Computation and interpretation of	100%	50%	0%	50%	100%	0%

Key Content	Organizing Component	Percent of Mathematics Performance Expectations Assessed By At Least One Test Item					
		ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
	probabilities						
	Probabilistic Reasoning Overall	**100%**	**75%**	**50%**	**75%**	**100%**	**0%**
Statistical Reasoning	A. Data collection	0%	0%	0%	0%	0%	0%
	B. Describe data	75%	75%	50%	75%	75%	100%
	C. Read, analyze, interpret, and draw conclusions from data	100%	100%	50%	50%	100%	100%
	Statistical Reasoning Overall	**58%**	**58%**	**33%**	**42%**	**58%**	**67%**
Functions	A. Recognition and representation of functions	100%	100%	50%	100%	50%	50%
	B. Analysis of functions	100%	100%	100%	100%	100%	100%
	C. Model real world situations with functions	100%	100%	100%	100%	100%	
	Functions Overall	**100%**	**100%**	**83%**	**100%**	**83%**	**75%**
Problem Solving and Reasoning	A. Mathematical problem solving	100%	80%	80%	100%	80%	80%
	B. Logical reasoning	100%	100%	100%	100%	100%	100%
	C. Real world problem solving	100%	67%	33%	100%	100%	100%
	Problem Solving and reasoning Overall	**100%**	**82%**	**71%**	**100%**	**93%**	**93%**
Communication and Representation	A. Language, terms, and symbols of mathematics	100%	100%	100%	100%	100%	100%
	B. Interpretation of mathematical work	100%	100%	50%	100%	100%	100%
	C. Presentation and representation of mathematical work	100%	67%	33%	33%	33%	100%
	Communications and Representations Overall	**100%**	**89%**	**61%**	**78%**	**78%**	**100%**
Connections	A. Connections among the strands of mathematics	100%	50%	50%	100%	50%	100%
	B. Connections of mathematics to nature, real-world situations, and everyday life	100%	33%	33%	33%	33%	100%
	Connections Overall	**100%**	**42%**	**42%**	**67%**	**42%**	**100%**
Key Cognitive Strategies	A. Intellectual curiosity	50%	**0%**	50%	**0%**	**0%**	**0%**
	B. Reasoning	25%	**0%**	**0%**	25%	**0%**	25%
	C. Problem solving	67%	67%	67%	67%	67%	100%
	D. Academic behaviors	25%	**0%**	**0%**	**0%**	25%	**0%**

Key Content	Organizing Component	Percent of Mathematics Performance Expectations Assessed By At Least One Test Item					
		ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
	E. Work habits	0%	**0%**	**0%**	**0%**	0%	**0%**
	F. Academic integrity	0%	**0%**	**0%**	**0%**	0%	**0%**
	Key Cognitive StrategiesOverall	**28%**	**11%**	**20%**	**15%**	**15%**	**21%**
Foundational Skills	A. Reading across the curriculum	38%	13%	38%	25%	25%	25%
	B. Writing across the curriculum	0%	33%	0%	0%	0%	0%
	C. Research across the curriculum	0%	0%	0%	0%	0%	0%
	D. Use of data	0%	0%	0%	0%	33%	100%
	E. Technology	0%	25%	0%	0%	0%	0%
	Foundational Skills Overall	**8%**	**14%**	**8%**	**5%**	**12%**	**25%**
Overall	**Total**	**81%**	**66%**	**58%**	**69%**	**72%**	**68%**

Note: Percents were computed using the total number of matches (if different reviewers identified the same item as assessing a performance expectation, that item counted each time it was identified). Shaded cells indicate the recommended benchmark of 50 percent was met.

Using the criteria that a test have at least one item assessing each performance expectation, all the tests sufficiently assess numeric reasoning, algebraic reasoning, geometric reasoning, measurement reasoning, functions, problem solving and reasoning, and communication and representation.

Less well covered are the cross-disciplinary skills. None of the tests sufficiently assess this, although all tests do asses the problem solving component of the key cognitive strategies, and the THEA assesses the use-of-data component of the foundational skills and has the best overall assessment of foundational skills.

The ACT provided the most comprehensive range of knowledge overall, with at least one test item assessing 81 percent of the performance expectations. Although the THEA had the fewest number of items, it performed as well as the other tests in terms the range of content covered.

Unique areas of coverage in terms of range of knowledge include:

- The ACT and THEA tests best assess the connections and communications and representations content

- The ACT and SAT assessed a slightly wider range of geometric reasoning and probabilistic reasoning content
- Although the ACT, ACCUPLACER, and SAT also assess a range of statistical reasoning expectations, the THEA provided slightly wider coverage of the statistical reasoning content
- Although no tests met the criteria of 50% for key cognitive strategies, the ACT, ASSET, and THEA provided slightly more coverage than did the others
- Although no tests met the criteria of 50% for foundational skills, the THEA provided slightly more coverage than did the others

The tests with more items might be expected to assess a wider range of knowledge than the tests with fewer items. This occurs to some extent for the test with the fewest items (THEA) because it assesses a smaller percent of performance expectations within each organizing component than do the other tests. However, it is not always the lowest nor is it consistently lower than the tests with the most items. Similarly, the test with the most items (ASSET) does not consistently have the most alignment. This suggests that—although the number of test items may affect the range of knowledge assessed by a test—the approach taken is able to measure differences in breadth between tests of various lengths and to observe consistent trends across them.

The ELA content is less consistently assessed by the tests than the mathematics content. Table 17 describes the range of knowledge for the ELA. On average, across all key content, the tests covered between 34 to 62 percent of the content described by the TCCRS.

Table 17. Range of Knowledge (using total number of matches) by ELA Test

Key Content	Organizing Component	Percent of ELA Performance Expectations Assessed by at Least One Test Item					
		ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
Writing	A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose.	100%	100%	100%	100%	100%	100%
	Writing Overall	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Key Content	Organizing Component	Percent of ELA Performance Expectations Assessed by at Least One Test Item					
		ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
Reading	A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths.	73%	73%	55%	45%	64%	64%
	B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.	33%	0%	33%	33%	33%	33%
	C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods.	50%	0%	25%	0%	0%	0%
	D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances.	50%	0%	0%	0%	0%	0%
	Reading Overall	**52%**	**18%**	**28%**	**20%**	**24%**	**24%**
Research	A. Formulate topic and questions.	0	0	0	0	0	0
	B. Select information from a variety of sources.	0%	0%	0%	0%	75%	0%
	Research Overall	**0%**	**0%**	**0%**	**0%**	**38%**	**0%**
Key Cognitive Strategies	A. Intellectual curiosity	0%	0%	0%	100%	100%	0%
	B. Reasoning	75%	100%	25%	100%	100%	75%
	C. Problem solving	33%	67%	33%	100%	67%	33%
	D. Academic behaviors	25%	25%	25%	100%	50%	25%
	E. Work habits	0%	0%	0%	100%	0%	0%
	F. Academic integrity	0%	25%	0%	100%	50%	25%
	Key Cognitive Strategies Overall	**22%**	**36%**	**14%**	**100%**	**61%**	**26%**
Foundational Skills	A. Reading across the curriculum	88%	63%	75%	75%	75%	75%
	B. Writing across the curriculum	100%	67%	67%	100%	100%	67%
	C. Research across the curriculum	0%	0%	0%	100%	0%	0%
	D. Use of data	0%	0%	0%	100%	0%	33%
	E. Technology	0%	0%	0%	75%	0%	0%
	Foundational Skills Overall	**38%**	**26%**	**28%**	**90%**	**35%**	**35%**
Overall	**Total**	**42%**	**36%**	**34%**	**62%**	**52%**	**37%**

Note: Percents were computed using the total number of matches (so that if different reviewers identified the same item as assessing a performance expectation, that item counted each time it was identified). Shaded cells in the table indicate the recommended benchmark of 50 percent was met.

While categorical concurrence identifies the tests that have enough items to reliably assess individual performance expectations, range of knowledge identifies the tests that

assess the most performance expectations. Using the criteria that tests have at least one item assessing each performance expectation, all tests sufficiently assess writing only. Reading and the cross-disciplinary skills are less well covered by the tests. Observations unique to each test are noted below:

- The COMPASS and the SAT sufficiently assess the key cognitive strategies, and the COMPASS is especially strong in assessing cross-disciplinary skills.
- Overall, the COMPASS has the highest average number of performance expectations assessed at least once, and it assesses unique content that other tests do not (especially within the cross-disciplinary skills).
- The SAT test is the only one to assess the organizing component of research (specifically, selecting resources from a variety of sources).
- Although the THEA has by far the fewest number of items, it again performs nearly as well in range of knowledge as the other tests in terms of content covered.

As with mathematics, the organizing components high in the range of knowledge tended to be high across all tests, regardless of the number of items. When these components were low, they tended to be low across all tests. This suggests that the modified approach continues to be sensitive enough to measure differences between ELA tests of various sizes and observes consistent trends across tests.

Appendix C provides detailed tables describing the total number of matches between test items and performance expectations for each test at the performance expectation level.

Interpretation of Findings

Results suggest that most of the admissions and placement tests reviewed align to a moderate to high level with the TCCRS performance expectations in mathematics and ELA. None of the tests aligns at a high level with the cross-disciplinary skills. The tests exhibited similar results for categorical-concurrence and range-of-knowledge measures.

In mathematics, alignment (as measured by both categorical concurrence and range of knowledge) is highest for numeric reasoning, algebraic reasoning, functions, problem solving and reasoning, and communications and representations; lower for connections,

geometric reasoning, measurement reasoning, and statistical reasoning; and lowest for foundational skills, probabilistic reasoning, and key cognitive strategies. These findings are consistent with the tests specifications. All of the tests are designed to assess numeric reasoning, algebraic reasoning, geometric reasoning, and functions; only one-third are designed to assess measurement reasoning, probabilistic reasoning, statistical reasoning, and problem solving reasoning; and none of the tests specify the connections content that are in the TCCRS.

In ELA, alignment (as measured by categorical concurrence and range of knowledge) is highest for writing, lower for reading and foundational skills, and lowest for key cognitive strategies. Although minimally assessed by the SAT, none of the tests provide sufficient assessment of the research performance expectations contained in the TCCRS. These findings are somewhat unexpected because all ELA tests are designed to assess reading and writing, yet only writing shows consistent and sufficient alignment.

Rater agreement was higher for mathematics items and standards than for ELA items and standards, suggesting perhaps that college readiness standards are still a new phenomenon for reviewers and that special attention needs to be paid to developing stronger common mental maps of the standards on the part of all reviewers before they begin rating test items. Reviewer agreement was higher for cognitive-demand ratings than for rigor ratings, which is counterintuitive as rigor is rated on a smaller scale (1–3 rather than 1–4) and evaluating whether an item or a standard is at the level of an entry-level college student might appear to be a more straightforward distinction to make than determining the thought process required by an item or standard. Other researchers report similar findings (Herman, Webb, Zuniga, 2005), suggesting that it may be easier to apply cognitive-demand ratings consistently than it is to apply rigor ratings consistently. While an agreement of 0.8 or higher is ideal, other studies in this area have yielded typical agreement measures for alignment studies closer to 0.5 (Blank, 2007), a criterion level that this study exceeds.

Analysis of the rigor and cognitive-demand ratings shows similar patterns for both measures. For the TCCRS subject areas, the ELA performance expectations are more

rigorous and cognitively demanding than are the cross-disciplinary skills and the mathematics standards. The mathematics standards are the least rigorous, averaging below the level at which an entry-level college student should be expected to perform. The ELA standards are the highest and averaged close to the level at which entry-level college students should be expected to perform. The cross-disciplinary skills fall between mathematics and ELA.

The most rigorous and cognitively demanding mathematics concepts involve statistical and logical reasoning. Although statistics is increasingly taught in high school, its concepts may be more abstract than typical high school mathematics content. Logical reasoning is a complex skill that is difficult to assess with multiple-choice items. The TCCRS are more rigorous and cognitively demanding than the test items in this area. This should not be unexpected because the TCCRS describe the knowledge and skills that college-ready students should have, while the test items assess a much broader range of proficiency in order to determine the level necessary to enter a credit-bearing course.

Some TCCRS are not assessed by any items on any of the tests. For mathematics, these include skills that may not be assessable by multiple-choice test items, including practical mathematics skills (planning a study, collecting data, analyzing relationships between paired data, recognizing reliability of statistical results). For ELA, these include practical reading skills (using reference guides to confirm the meanings of new words or concepts, reading a variety of texts from world literatures, etc.) and practical research skills (formulating a research question, exploring a research topic, using source material ethically, etc.) and include skills not practical in a typical standardized testing environment, even with the use of constructed-response type items.

The lack of coverage for these standards suggests that to assess the full range of knowledge and skills necessary to be college ready in the state of Texas may eventually require additional methods. Previous research supports this, suggesting that item type is an important factor in determining what *assessable* content is (Rothman, 2004), and that using multiple methods, including performance assessment and constructed

response-type items in more subjects than writing, may be necessary to cover fully content that is not assessable through multiple-choice items. It may be worth considering combining multiple-choice test results with end-of-course-exam results, senior demonstrations or projects, performance assessments, or portfolios in order to gauge student readiness across the full set of college and career standards.

Additional work may be needed to standardize the methodology for including test pools in alignment studies. As noted earlier, previous researchers using both test forms and item pools in an alignment study have tended not to address explicitly the likely impact on findings resulting from the different number of items. Although similar results were found across test pools and forms, metrics that rely upon counts may not always be comparable. As such, the SAT and THEA may be even stronger than was determined because they stood their own when compared to tests represented by larger item pools. Future research should be conducted to refine methods for direct comparisons of test forms to test-item banks.

Findings Relative to Research Questions

This study is organized around a series of research questions that are presented in the introductory section. Table 18 describes summary findings by each of these research questions by assessment analyzed. For mathematics, the SAT and ACT are the most cognitively demanding, have the highest rate of categorical concurrence, and demonstrate the most consistent relationship between the standards they assess and the cognitive demand of their items. Additionally, the ACT has the greatest range of knowledge. For ELA, the THEA and ACCUPLACER are the most rigorous, cognitively demanding, and the most consistent with the standards they assess in terms of cognitive demand. The THEA also shows the most consistent relationship between the performance expectations it assesses and the rigor of its items. The SAT demonstrates unique categorical concurrence with statistical reasoning and was the only one to evidence categorical concurrence with research performance expectations. The THEA has the fewest number of items of the all assessments, but it performs as well as the other assessment in terms of content covered. Finally, the COMPASS ELA test demonstrates categorical concurrence uniquely with more content than do the other

tests. There were no consistent differences between computer-based tests and paper-and-pencil tests.

Table 18 summarizes findings for each of the research objectives. To help clarify the summary, some research questions were divided into multiple questions and are indicated by a lowercase letter after the number for the corresponding research question.

Table 18. Summary of Research Question Findings

Research Question	Mathematics	ELA	Notes
1. Which test(s) are most and least aligned to the key content in mathematics and ELA?			
1a. Which tests demonstrate the highest degree of categorical concurrence?	ACT, COMPASS, ASSET, and SAT	All tests were nearly identical	SAT was uniquely strong in assessing statistical reasoning and the SAT writing test was the only one to assess Research. THEA and SAT provide comparable alignment to tests with more items.
1b. Which tests assess the greatest breadth of performance expectations?	ACT	COMPASS	Although the THEA and SAT has the fewest number of items, they perform as well as the other tests in terms of content covered, the COMPASS ELA test covers the most unique content.
2. Which test(s) are most aligned with the cross-disciplinary skills?			
2a. Which tests are most aligned with the cross-disciplinary skills?	None align	None align	For mathematics, only the problem solving and reading across the curriculum organizing components are minimally assessed; for ELA more components are assessed than for mathematics, although only minimally, including reasoning, problem solving, academic behaviors, reading across the curriculum, and writing across the curriculum.
3. Do tests assess each standard, and if not, which are omitted?			
3b. Do any key content areas have performance expectations that are not assessed by any test items, and if so how many?	Statistical reasoning (3)	Reading (6) and research (6)	Many practical skills that were not assessed may not be measurable with multiple-choice test items.
4. What are the areas of strongest alignment and what are the areas of weakest alignment?			
4a. Which TCCRS are assessed by the most test items?	Algebraic reasoning, problem solving, and reasoning	Writing	The TCCRS lower in rigor and cognitive demand tended to be assessed the most.
4b. Which TCCRS are assessed by the least test items?	Probabilistic reasoning and statistical reasoning	Research	
5. Which content areas of the TCCRS are most and least rigorous and cognitively demanding?			
5a. Which TCCRS are most rigorous and cognitively demanding?	Problem solving, reasoning, and connections	Writing and research	The most rigorous and cognitively demanding organizing components of all the TCCRS are data collection, logical reasoning, and read, analyze interpret and draw conclusions.
5b. Which TCCRS are least rigorous and cognitively demanding?	Numeric reasoning and algebraic reasoning	Reading	Mathematics was less rigorous and cognitively demanding than ELA.
6. Which tests have a level of rigor and cognitive demand that is similar to or higher than the corresponding rigor and cognitive-demand level of the performance expectations assessed?			
6a. Which key content areas are more rigorous or cognitively demanding than the test items assessing them?	Connections, problem solving and reasoning, and key cognitive strategies	Writing	Nearly all are, except for numeric reasoning, algebraic reasoning, measurement reasoning and probabilistic reasoning in mathematics.

Research Question	Mathematics	ELA	Notes
6b. Which tests are most consistent in cognitive demand to the performance expectations assessed?	SAT and ACT	ACCUPLACER and THEA	The SAT test was more challenging in terms of cognitive demand.
6c. Which tests are most consistent in rigor to the performance expectations they assessed?	All tests were nearly identical	THEA	
6d. Which tests are the most cognitively demanding?	SAT, ACT, and THEA	ACCUPLACER and THEA	
6e. Which tests are the most rigorous?	All tests were nearly identical	THEA, ACCUPLACER, and SAT	

The study was not intended to yield one test as clearly superior to all others as a means to assess the TCCRS, and, in fact, no one test does so. Some TCCRS performance expectations are sufficiently and comprehensively covered by a number of available placement and admissions tests, while others are not.

The results do provide guidance on how to utilize the scores from each of the tests, to determine the areas in which test scores may be good measures of readiness on each test, and to identify the topics that are under-assessed or not measured at all. The findings from this study can be useful when viewed within a broader conception of college readiness in which results of literacy and numeracy assessments are considered as two dimensions in what is likely a multidimensional model of readiness. Rather than focusing on summary tests scores for the purpose of making a simple dichotomous decision that a student is college ready or is in or out of developmental education, much more information may be necessary. Existing tests are a good starting point, but comprehensive views of college readiness will require more and diverse information about student knowledge and skills, behaviors and understandings.

Based on this study, the recommendation to the Texas Higher Education Coordinating Board is to consider the development and introduction of measures and assessments that are based on broader and more robust conceptions of college readiness that are consistent with the full set of TCCRS. Such an approach would help lead the nation in a direction in which college readiness became the expression of a full range of skills and capabilities, some of which can be measured by current commercially available instruments and others that will require new tools and methods. Such a system would be able to provide the full range of information that is necessary to know if students are

truly college ready and to identify and diagnose the specific areas where students need additional help, practice, support, and skill building to be prepared to succeed in entry-level college courses.

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Appendix A: College and Career Readiness Standards

Content Standards for ELA

Organized by key content, organizing component, and performance expectation

I. Writing
A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose
1. Determine effective approaches, forms, and rhetorical techniques that demonstrate understanding of the writer's purpose and audience
2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources
3. Evaluate relevance, quality, sufficiency, and depth of preliminary ideas and information; organize material generated; and formulate thesis
4. Recognize the importance of revision as the key to effective writing. Each draft should refine key ideas and organize them more logically and fluidly, use language more precisely and effectively, and draw the reader to the author's purpose
5. Edit writing for proper voice, tense, and syntax, assuring that it conforms to standard English, when appropriate
II. Reading
A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths
1. Use effective reading strategies to determine a written work's purpose and intended audience
2. Use text features and graphics to form an overview of informational texts and to determine where to locate information
3. Identify explicit and implicit textual information including main ideas and author's purpose
4. Draw and support complex inferences from text to summarize, draw conclusions, and distinguish facts from simple assertions and opinions
5. Analyze the presentation of information and the strength and quality of evidence used by the author, and judge the coherence and logic of the presentation and the credibility of an argument

6. Analyze imagery in literary texts
7. Evaluate the use of both literal and figurative language to inform and shape the perceptions of readers
8. Compare and analyze how generic features are used across texts
9. Identify and analyze the audience, purpose, and message of an informational or persuasive text
10. Identify and analyze how an author's use of language appeals to the senses, creates imagery, and suggests mood
11. Identify, analyze, and evaluate similarities and differences in how multiple texts present information, argue a position, or relate a theme
B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing
1. Identify new words and concepts acquired through study of their relationships to other words and concepts
2. Apply knowledge of roots and affixes to infer the meanings of new words
3. Use reference guides to confirm the meanings of new words or concepts
C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods
1. Read a wide variety of texts from American, European, and world literatures
2. Analyze themes, structures, and elements of myths, traditional narratives, and classical and contemporary literature
3. Analyze works of literature for what they suggest about the historical period and cultural contexts in which they were written
4. Analyze and compare the use of language in literary works from a variety of world cultures
D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances
1. Describe insights gained about oneself, others, or the world from reading specific texts
2. Analyze the influence of myths, folktales, fables, and classical literature from a variety of world cultures on later literature and film
V. Research
A. Formulate topic and questions
1. Formulate research questions

2. Explore a research topic
3. Refine research topic and devise a timeline for completing work
B. Select information from a variety of sources
1. Gather relevant sources
2. Evaluate the validity and reliability of sources
3. Synthesize and organize information effectively
4. Use source material ethically
C. Produce and design a document
1. Design and present an effective product
2. Use source material ethically

Content Standards for Mathematics

Organized by key content, organizing component, and performance expectation

I. Numeric Reasoning
A. Number representation
1. Compare real numbers
2. Define and give examples of complex numbers
B. Number operations
1. Perform computations with real and complex numbers
C. Number sense and number concepts
1. Use estimation to check for errors and reasonableness of solutions
II. Algebraic Reasoning
A. Expressions and equations
1. Explain and differentiate between expressions and equations using words such as solve, evaluate, and simplify
B. Manipulating expression
1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions)
C. Solving equations, inequalities, and systems of equations
1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations
2. Explain the difference between the solution set of an equation and the solution set of an inequality
D. Representations
1. Interpret multiple representations of equations and relationships
2. Translate among multiple representations of equations and relationships
III. Geometric Reasoning
A. Figures and their properties

1. Identify and represent the features of plane and space figures
2. Make, test, and use conjectures about one-, two-, and three-dimensional figures and their properties
3. Recognize and apply right-triangle relationships, including basic trigonometry
B. Transformations and symmetry
1. Identify and apply transformations to figures
2. Identify the symmetries of a plane figure
3. Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures
C. Connections between geometry and other mathematical content strands
1. Make connections between geometry and algebra
2. Make connections between geometry, statistics, and probability
3. Make connections between geometry and measurement
D. Logic and reasoning in geometry
1. Make and validate geometric conjectures
2. Understand that Euclidean geometry is an axiomatic system
IV. Measurement Reasoning
A. Measurement involving physical and natural attributes
1. Select or use the appropriate type of unit for the attribute being measured
B. Systems of measurement
1. Convert from one measurement system to another
2. Convert within a single measurement system
C. Measurement involving geometry and algebra
1. Find the perimeter and area of two-dimensional figures
2. Determine the surface area and volume of three-dimensional figures
3. Determine indirect measurements of figures using scale drawings, similar figures, Pythagorean Theorem, and basic trigonometry

D. Measurement involving statistics and probability
1. Compute and use measures of center and spread to describe data
2. Apply probabilistic measures to practical situations to make an informed decision
V. Probabilistic Reasoning
A. Counting principles
1. Determine the nature and the number of elements in a finite sample space
B. Computation and interpretation of probabilities
1. Compute and interpret the probability of an event and its complement
2. Compute and interpret the probability of conditional and compound events
VI. Statistical Reasoning
A. Data collection
1. Plan a study
B. Describe data
1. Determine types of data
2. Select and apply appropriate visual representations of data
3. Compute and describe summary statistics of data
4. Describe patterns and departure from patterns in a set of data
C. Read, analyze, interpret, and draw conclusions from data
1. Make predictions and draw inferences using summary statistics
2. Analyze data sets using graphs and summary statistics
3. Analyze relationships between paired data using spreadsheets, graphing calculators, or statistical software
4. Recognize reliability of statistical results
VII. Functions
A. Recognition and representation of functions
1. Recognize whether a relation is a function

2. Recognize and distinguish between different types of functions
B. Analysis of functions
1. Understand and analyze features of a function
2. Algebraically construct and analyze new functions
C. Model real-world situations with functions
1. Apply known function models
2. Develop a function to model a situation
VIII. Problem Solving and Reasoning
A. Mathematical problem solving
1. Analyze given information
2. Formulate a plan or strategy
3. Determine a solution
4. Justify the solution
5. Evaluate the problem solving process
B. Logical reasoning
1. Develop and evaluate convincing arguments
2. Use various types of reasoning
C. Real-world problem solving
1. Formulate a solution to a real-world situation based on the solution to a mathematical problem
2. Use a function to model a real-world situation
3. Evaluate the problem solving process
IX. Communication and Representation
A. Language, terms, and symbols of mathematics
1.Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem
2. Use mathematical language to represent and communicate the mathematical concepts in a problem

3. Use mathematics as a language for reasoning, problem solving, making connections, and generalizing
B. Interpretation of mathematical work
1. Model and interpret mathematical ideas and concepts using multiple representations
2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context
C. Presentation and representation of mathematical work
1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words
2. Create and use representations to organize, record, and communicate mathematical ideas
3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications
X. Connections
A. Connections among the strands of mathematics
1. Connect and use multiple strands of mathematics in situations and problems
2. Connect mathematics to the study of other disciplines
B. Connections of mathematics to nature, real-world situations, and everyday life
1. Use multiple representations to demonstrate links between mathematical and real-world situations
2. Understand and use appropriate mathematical models in the natural, physical, and social sciences
3. Know and understand the use of mathematics in a variety of careers and professions

Content Standards for Cross-Disciplinary Skills

Organized by key content, organizing component, and performance expectation

I. Key Cognitive Skills
A. Intellectual curiosity
1. Engage in scholarly inquiry and dialogue
2. Accept constructive criticism and revise personal views when valid evidence warrants
B. Reasoning
1. Consider arguments and conclusions of self and others
2. Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions
3. Gather evidence to support arguments, findings, or lines of reasoning
4. Support or modify claims based on the results of an inquiry
C. Problem solving
1. Analyze a situation to identify a problem to be solved
2. Develop and apply multiple strategies to solving a problem
3. Collect evidence and data systematically and directly relate to solving a problem
D. Academic behaviors
1. Self-monitor learning needs and seek assistance when needed
2. Use study habits necessary to manage academic pursuits and requirements
3. Strive for accuracy and precision
4. Persevere to complete and master tasks
E. Work habits
1. Work independently
2. Work collaboratively
F. Academic integrity

1. Attribute ideas and information to source materials and people
2. Evaluate sources for quality of content, validity, credibility, and relevance
3. Include the ideas of others and the complexities of the debate, issue, or problem
4. Understand and adhere to ethical codes of conduct
II. Foundational Skills
A. Reading across the curriculum
1. Use effective prereading strategies
2. Use a variety of strategies to understand the meanings of new words
3. Identify the intended purpose and audience of the text
4. Identify the key information and supporting details
5. Analyze textual information critically
6. Annotate, summarize, paraphrase, and outline texts when appropriate
7. Adapt reading strategies according to structure of texts
8. Connect reading to historical and current events and personal interest
B. Writing across the curriculum
1. Write clearly and coherently using standard writing conventions
2. Write in a variety of forms for various audiences and purposes
3. Compose and revise drafts
C. Research across the curriculum
1. Understand which topics or questions are to be investigated
2. Explore a research topic
3. Refine research topic based on preliminary research and devise a timeline for completing work
4. Evaluate the validity and reliability of sources
5. Synthesize and organize information effectively
6. Design and present an effective product

7. Integrate source material
8. Present final product
D. Use of data
1. Identify patterns or departures from patterns among data
2. Use statistical and probabilistic skills necessary for planning an investigation, and collecting, analyzing, and interpreting data
3. Present analyzed data and communicate findings in a variety of formats
E. Technology
1. Use technology to gather information
2. Use technology to organize, manage, and analyze information
3. Use technology to communicate and display findings in a clear and coherent manner
4. Use technology appropriately

Appendix B. Average Rigor and Cognitive Demand by Test and Organizing Component

Average Mathematics Rigor Ratings by Test and Organizing Component

Key Content	Organizing Component	Mathematics: Difference Between Item and Performance Expectation Rigor											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Numeric Reasoning	A. Number representation	0.045	0.105	0.008	0.059	0.008	0.072	0.024	0.115	0.060	0.127	0.167	
	B. Number operations	-0.144	0.071	-0.121	0.131	-0.152	0.054	-0.146	0.079	-0.090	0.123	-0.105	0.121
	C. Number sense and number concepts	0.032	0.067	0.000	0.000	0.009	0.038	0.013	0.069	0.125	0.160	0.167	
	Total	**-0.097**	**0.112**	**-0.088**	**0.128**	**-0.129**	**0.079**	**-0.116**	**0.105**	**-0.053**	**0.141**	**-0.093**	**0.131**
Algebraic Reasoning	A. Expressions and equations	-0.145	0.057	-0.116	0.106	-0.146	0.055	-0.099	0.169	-0.139	0.068	-0.167	0.000
	B. Manipulating expression	0.016	0.053	0.081	0.134	0.020	0.061	0.063	0.149	0.081	0.124	0.020	0.077
	C. Solving equations, inequalities, and systems of equations	0.009	0.046	0.094	0.153	0.009	0.054	0.052	0.144	0.077	0.125	0.015	0.048
	D. Representations	-0.051	0.126	-0.031	0.145	-0.068	0.107	-0.048	0.152	-0.003	0.141	-0.004	0.160
	Total	**-0.027**	**0.106**	**0.043**	**0.154**	**-0.021**	**0.092**	**-0.005**	**0.160**	**0.023**	**0.141**	**0.000**	**0.137**
Geometric Reasoning	A. Figures and their properties	-0.077	0.172	0.177	0.211	-0.081	0.199	0.041	0.271	-0.060	0.186	-0.119	0.195
	B. Transformations and symmetry	-0.100	0.155	0.267	0.091	-0.270	0.138	-0.105	0.314	-0.026	0.127	-0.333	0.000
	C. Connections between geometry and other mathematical content strands	-0.042	0.126	0.043	0.177	-0.031	0.121	-0.012	0.161	-0.017	0.154	-0.010	0.184
	D. Logic and reasoning in geometry	-0.154	0.045			-0.112	0.125	-0.167	0.000	-0.125	0.077	-0.167	0.000
	Total	**-0.063**	**0.151**	**0.107**	**0.204**	**-0.066**	**0.172**	**0.009**	**0.229**	**-0.040**	**0.169**	**-0.082**	**0.195**
Measurement Reasoning	A. Measurement involving physical and natural attributes	0.000	0.000	0.000	0.000			0.000		0.111	0.192	0.417	0.118
	B. Systems of measurement	0.011	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.194
	C. Measurement involving geometry and algebra	-0.073	0.087	0.137	0.171	-0.080	0.110	-0.019	0.145	0.042	0.171	0.078	0.226
	D. Measurement involving statistics and probability	-0.333								-0.333		0.000	
	Total	**-0.067**	**0.089**	**0.116**	**0.165**	**-0.069**	**0.106**	**-0.018**	**0.142**	**0.038**	**0.171**	**0.100**	**0.223**
Probabilistic Reasoning	A. Counting principles	-0.146	0.057	-0.133	0.069	-0.083	0.088	-0.167	.	-0.048	0.102		
	B. Computation and interpretation of probabilities	-0.228	0.127	-0.167	0.000			-0.167	0.000	-0.180	0.107		

Key Content	Organizing Component	Mathematics: Difference Between Item and Performance Expectation Rigor											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	Total	**-0.191**	**0.108**	**-0.144**	**0.059**	**-0.083**	**0.088**	**-0.167**	**0.000**	**-0.111**	**0.122**		
Statistical Reasoning	B. Describe data	0.006	0.032	-0.056	0.083	0.000	0.000	-0.004	0.027	0.037	0.155	0.093	0.107
	C. Read, analyze, interpret, and draw conclusions from data	-0.333	0.154	-0.381	0.078	-0.333		-0.500	0.000	-0.281	0.130	-0.217	0.081
	Total	**-0.069**	**0.161**	**-0.254**	**0.180**	**-0.010**	**0.056**	**-0.017**	**0.082**	**-0.113**	**0.214**	**0.009**	**0.171**
Functions	A. Recognition and representation of functions	0.133	0.139	0.115	0.134	0.083	0.162	0.100	0.123	0.000		0.167	
	B. Analysis of functions	0.038	0.160	0.169	0.141	0.074	0.120	0.154	0.231	0.066	0.154	0.008	0.081
	C. Model real-world situations with functions	-0.088	0.291	0.117	0.301	0.011	0.231	0.061	0.298	-0.167	0.408	-0.189	0.434
	Total	**-0.009**	**0.230**	**0.158**	**0.165**	**0.066**	**0.141**	**0.141**	**0.240**	**0.032**	**0.223**	**-0.085**	**0.323**
Problem Solving and Reasoning	A. Mathematical problem solving	-0.201	0.141	-0.141	0.190	-0.222	0.138	-0.193	0.174	-0.145	0.167	-0.157	0.169
	B. Logical reasoning	-0.111	0.320	-0.250	0.589	-0.405	0.142	-0.308	0.139	-0.143	0.169	-0.391	0.192
	C. Real-world problem solving	-0.325	0.132	-0.310	0.063	-0.306	0.073	-0.299	0.154	-0.267	0.118	-0.208	0.205
	Total	**-0.210**	**0.147**	**-0.143**	**0.191**	**-0.225**	**0.138**	**-0.198**	**0.175**	**-0.148**	**0.167**	**-0.172**	**0.180**
Communication and Representation	A. Language, terms, and symbols of mathematics	0.018	0.112	0.019	0.091	0.005	0.071	0.027	0.144	0.051	0.093	0.022	0.071
	B. Interpretation of mathematical work	-0.145	0.110	-0.114	0.129	-0.145	0.069	-0.133	0.125	-0.076	0.125	-0.097	0.143
	C. Presentation and representation of mathematical work	-0.148	0.100	-0.111	0.172	-0.134	0.080	-0.046	0.151	-0.037	0.139	-0.111	0.110
	Total	**-0.107**	**0.130**	**-0.089**	**0.134**	**-0.127**	**0.085**	**-0.110**	**0.139**	**-0.065**	**0.128**	**-0.078**	**0.137**
Connections	A. Connections among the strands of mathematics	-0.285	0.125	-0.191	0.157	-0.306	0.090	-0.265	0.151	-0.256	0.118	-0.215	0.193
	B. Connections of mathematics to nature, real-world situations, and everyday life	-0.324	0.136	-0.266	0.163	-0.311	0.064	-0.287	0.173	-0.265	0.139	-0.232	0.184
	Total	**-0.305**	**0.132**	**-0.219**	**0.162**	**-0.307**	**0.083**	**-0.272**	**0.158**	**-0.260**	**0.128**	**-0.226**	**0.186**
Key Cognitive Strategies	A. Intellectual curiosity	-1.167				-1.167							
	B. Reasoning	-0.750						-0.750				-0.639	0.096
	C. Problem solving	-0.663	0.135	-0.606	0.164	-0.656	0.105	-0.594	0.164	-0.576	0.134	-0.614	0.143
	D. Academic behaviors	-0.500								-0.250	0.118		
	Total	**-0.664**	**0.137**	**-0.606**	**0.164**	**-0.656**	**0.106**	**-0.594**	**0.164**	**-0.574**	**0.135**	**-0.615**	**0.142**
Foundational Skills	A. Reading across the curriculum	-0.213	0.112	-0.181	0.135	-0.226	0.079	-0.187	0.150	-0.161	0.129	-0.157	0.129
	B. Writing across the curriculum			0.000									

Key Content	Organizing Component	Mathematics: Difference Between Item and Performance Expectation Rigor											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	D. Use of data									-0.333		-0.583	0.220
	E. Technology			-0.333									
	Total	**-0.213**	**0.112**	**-0.181**	**0.135**	**-0.226**	**0.079**	**-0.187**	**0.150**	**-0.162**	**0.130**	**-0.208**	**0.197**

Note: Blank cells indicate no items were aligned on that test with that performance expectation. Standard deviations are not presented for means based on a single item. Counts are provided in the corresponding tables in Appendix D. Organizing components not assessed by test items on any of the tests are not listed in this table.

Average ELA Rigor Ratings by Test and Organizing Component

Key Content	Organizing Component	ELA: Difference Between Item and Performance Expectation Rigor											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Writing	A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose	-0.559	0.235	-0.538	0.237	-0.630	0.207	-0.605	0.270	-0.526	0.219	-0.472	0.272
	Total	**-0.559**	**0.235**	**-0.538**	**0.237**	**-0.630**	**0.207**	**-0.605**	**0.270**	**-0.526**	**0.219**	**-0.472**	**0.272**
Reading	A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths	-0.215	0.278	-0.278	0.270	-0.329	0.241	-0.297	0.178	-0.089	0.248	-0.205	0.278
	B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing	-0.035	0.163			-0.136	0.065	-0.154	0.045	0.103	0.180	-0.024	0.128
	C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods	-0.475	0.234			-0.656	0.149						
	D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances	-0.167											
	Total	**-0.214**	**0.278**	**-0.278**	**0.270**	**-0.320**	**0.239**	**-0.292**	**0.177**	**-0.076**	**0.249**	**-0.198**	**0.276**
Research	B. Select information from a variety of sources									0.194	0.368		
	Total									**0.194**	**0.368**		
Key Cognitive Strategies	A. Intellectual curiosity							-1.042	0.177	-0.167			
	B. Reasoning	-0.403	0.218	-0.406	0.176	-0.517	0.149	-0.135	0.405	-0.207	0.224	-0.343	0.249
	C. Problem solving	-0.557	0.146	-0.454	0.128	-0.615	0.080	-0.623	0.102	-0.507	0.185	-0.440	0.266
	D. Academic behaviors	-0.099	0.167	-0.046	0.143	-0.176	0.109	-0.162	0.192	-0.033	0.193	0.007	0.190
	E. Work habits							-0.125	0.059				
	F. Academic integrity			-0.083	0.000			-0.604	0.197	0.250	0.000	0.250	
	Total	**-0.283**	**0.271**	**-0.209**	**0.241**	**-0.337**	**0.233**	**-0.311**	**0.292**	**-0.218**	**0.294**	**-0.119**	**0.281**
Foundational Skills	A. Reading across the curriculum	-0.029	0.210	-0.110	0.229	-0.157	0.212	-0.141	0.175	-0.061	0.261	-0.044	0.210
	B. Writing across the curriculum	0.052	0.195	0.130	0.156	-0.025	0.123	-0.011	0.191	0.064	0.179	0.189	0.243

Key Content	Organizing Component	ELA: Difference Between Item and Performance Expectation Rigor											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	C. Research across the curriculum							-0.594	0.225				
	D. Use of data							-0.806	0.268			-0.417	
	E. Technology							-0.278	0.173				
	Total	**0.017**	**0.206**	**0.013**	**0.229**	**-0.081**	**0.179**	**-0.074**	**0.206**	**0.011**	**0.226**	**0.041**	**0.250**

Note. Blank cells indicate no items were aligned on that test with that performance expectation. Standard deviations are not presented for means based on a single item. Counts are provided in the corresponding tables in Appendix D. Organizing components not assessed by test items on any of the tests are not listed in this table.

Average Mathematics Cognitive Demand Ratings by Test and Organizing Component

Key Content	Organizing Component	Mathematics: Difference Between Item and PE Cognitive Demand											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Numeric Reasoning	A. Number representation	0.849	0.453	0.228	0.248	0.295	0.395	0.507	0.435	0.926	0.381	1.167	
	B. Number operations	0.841	0.495	0.261	0.355	0.349	0.461	0.410	0.465	1.049	0.371	0.903	0.404
	C. Number sense and number concepts	0.071	0.452	-0.677	0.195	-0.737	0.258	-0.712	0.232	0.042	0.417	0.333	
	Total	**0.794**	**0.518**	**0.173**	**0.421**	**0.262**	**0.530**	**0.340**	**0.537**	**0.999**	**0.404**	**0.896**	**0.406**
Algebraic Reasoning	A. Expressions and equations	-0.196	0.509	-0.475	0.174	-0.482	0.223	-0.362	0.366	0.222	0.524	-0.444	0.202
	B. Manipulating expression	0.309	0.471	0.169	0.322	0.074	0.310	0.194	0.391	0.705	0.489	0.069	0.274
	C. Solving equations, inequalities, and systems of equations	0.591	0.466	0.315	0.373	0.305	0.484	0.376	0.472	0.753	0.455	0.052	0.253
	D. Representations	0.066	0.323	-0.179	0.289	-0.027	0.287	-0.088	0.343	0.169	0.246	-0.052	0.354
	Total	**0.222**	**0.449**	**0.077**	**0.391**	**0.088**	**0.397**	**0.055**	**0.428**	**0.361**	**0.433**	**-0.023**	**0.334**
Geometric Reasoning	A. Figures and their properties	0.351	0.945	0.282	0.745	0.238	1.052	0.159	0.938	0.336	0.996	-0.238	1.064
	B. Transformations and symmetry	0.489	0.662	0.367	0.183	-0.345	0.610	-0.222	0.615	0.289	0.585	-0.833	0.289
	C. Connections between geometry and other mathematical content strands	0.237	0.470	-0.053	0.356	0.184	0.516	0.005	0.467	0.321	0.348	-0.085	0.516
	D. Logic and reasoning in geometry	-0.308	0.663			-0.147	0.696	-0.553	0.713	-0.167	0.655	-0.591	0.603
	Total	**0.284**	**0.750**	**0.105**	**0.588**	**0.190**	**0.861**	**0.066**	**0.759**	**0.316**	**0.738**	**-0.214**	**0.827**
Measurement Reasoning	A. Measurement involving physical and natural attributes	1.000	0.167	0.690	0.150			0.833		0.722	0.385	1.417	0.118
	B. Systems of measurement	1.078	0.107	0.833	0.000	0.917	0.139	0.875	0.075	1.167	0.000	1.271	0.266
	C. Measurement involving geometry and algebra	0.688	0.488	0.530	0.479	0.635	0.458	0.476	0.506	0.920	0.442	0.613	0.696
	D. Measurement involving statistics and probability	-0.500								-1.167		1.167	
	Total	**0.711**	**0.486**	**0.563**	**0.450**	**0.673**	**0.439**	**0.490**	**0.503**	**0.900**	**0.487**	**0.778**	**0.680**
Probabilistic Reasoning	A. Counting principles	0.854	0.201	0.789	0.076	0.750	0.088	0.833		1.000	0.207		
	B. Computation and interpretation of probabilities	0.404	0.540	0.690	0.063			0.611	0.323	0.974	0.271		
	Total	**0.610**	**0.473**	**0.758**	**0.085**	**0.750**	**0.088**	**0.623**	**0.318**	**0.988**	**0.235**		
Statistical	B. Describe data	0.607	0.171	-0.259	0.547	0.446	0.079	0.346	0.390	0.537	0.365	0.358	0.313

Key Content	Organizing Component	Mathematics: Difference Between Item and PE Cognitive Demand											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Reasoning	C. Read, analyze, interpret, and draw conclusions from data	-0.417	0.236	-0.810	0.234	-1.000		-0.667	0.236	-0.359	0.247	-0.533	0.258
	Total	**0.380**	**0.469**	**-0.594**	**0.466**	**0.405**	**0.257**	**0.321**	**0.417**	**0.115**	**0.549**	**0.117**	**0.498**
Functions	A. Recognition and representation of functions	0.867	0.492	0.253	0.366	0.033	0.358	0.200	0.191	0.833		0.667	
	B. Analysis of functions	-0.155	0.613	-0.315	0.448	-0.552	0.442	-0.480	0.599	0.031	0.500	-0.485	0.460
	C. Model real-world situations with functions	-0.073	0.585	-0.178	0.408	-0.458	0.411	-0.462	0.508	-0.048	0.608	-0.295	0.716
	Total	**-0.088**	**0.622**	**-0.241**	**0.468**	**-0.527**	**0.444**	**-0.460**	**0.591**	**0.025**	**0.518**	**-0.367**	**0.616**
Problem Solving and Reasoning	A. Mathematical problem solving	-0.838	0.496	-10.161	0.472	-0.928	0.513	-1.114	0.556	-0.775	0.463	-1.002	0.537
	B. Logical reasoning	-1.278	0.478	-1.833	1.414	-1.464	0.371	-1.125	0.440	-0.913	0.467	-1.174	0.374
	C. Real-world problem solving	-0.880	0.389	-0.929	0.286	-0.956	0.161	-0.882	0.250	-0.753	0.281	-0.810	0.499
	Total	**-0.845**	**0.490**	**-1.161**	**0.474**	**-0.931**	**0.510**	**-10.109**	**0.550**	**-0.777**	**0.460**	**-0.995**	**0.531**
Communication and Representation	A. Language, terms, and symbols of mathematics	0.130	0.441	0.035	0.321	-0.072	0.419	-0.097	0.537	0.297	0.326	-0.118	0.361
	B. Interpretation of mathematical work	0.062	0.330	-0.179	0.282	0.001	0.277	-0.080	0.347	0.177	0.267	-0.079	0.402
	C. Presentation and representation of mathematical work	-0.093	0.290	-0.472	0.340	-0.366	0.506	-0.500	0.435	0.148	0.269	-0.175	0.374
	Total	**0.075**	**0.359**	**-0.146**	**0.305**	**-0.021**	**0.316**	**-0.089**	**0.382**	**0.186**	**0.273**	**-0.097**	**0.391**
Connections	A. Connections among the strands of mathematics	-0.613	0.386	-0.898	0.336	-0.677	0.427	-0.859	0.412	-0.563	0.284	-0.764	0.501
	B. Connections of mathematics to nature, real-world situations, and everyday life	-0.404	0.265	-0.500	0.203	-0.482	0.184	-0.444	0.259	-0.306	0.244	-0.424	0.358
	Total	**-0.507**	**0.346**	**-0.750**	**0.350**	**-0.620**	**0.383**	**-0.737**	**0.418**	**-0.439**	**0.294**	**-0.540**	**0.440**
Key Cognitive Strategies	A. Intellectual curiosity	-0.750				-1.250							
	B. Reasoning	-1.250						-1.083				-0.750	0.167
	C. Problem solving	-1.200	0.417	-1.672	0.391	-1.385	0.497	-1.402	0.461	-1.050	0.323	-1.311	0.430
	D. Academic behaviors	-0.667								-0.250	0.118		
	Total	**-1.198**	**0.417**	**-1.672**	**0.391**	**-1.385**	**0.497**	**-1.401**	**0.461**	**-1.046**	**0.328**	**-1.301**	**0.433**
Foundational Skills	A. Reading across the curriculum	0.045	0.454	-0.482	0.394	-0.334	0.528	-0.262	0.481	0.181	0.348	0.090	0.397
	B. Writing across the curriculum			-0.167									

Key Content	Organizing Component	Mathematics: Difference Between Item and PE Cognitive Demand											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	D. Use of data									-0.250		-0.881	0.565
	E. Technology			-0.083									
	Total	**0.045**	**0.454**	**-0.480**	**0.394**	**-0.334**	**0.528**	**-0.262**	**0.481**	**0.179**	**0.349**	**-0.025**	**0.522**

Note: Blank cells indicate no items were aligned on that test with that performance expectation. Standard deviations are not presented for means based on a single item. Counts are provided in the corresponding tables in Appendix D. Performance expectations listed in Appendix A but not listed here were not assessed by any items on any tests. Organizing components not assessed by test items on any of the tests are not listed in this table.

Average ELA Cognitive Demand Ratings by Test and Organizing Component

Key Content	Organizing Component	ELA: Difference Between Item and PE Cognitive Demand											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Writing	A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose	-0.833	0.456	-0.630	0.411	-0.913	0.388	-0.710	0.568	-0.752	0.443	-0.648	0.536
	Total	**-0.833**	**0.456**	**-0.630**	**0.411**	**-0.913**	**0.388**	**-0.710**	**0.568**	**-0.752**	**0.443**	**-0.648**	**0.536**
Reading	A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths	-0.381	0.494	-0.290	0.478	-0.497	0.481	-0.418	0.370	-0.192	0.435	-0.398	0.501
	B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing	-0.123	0.228			-0.127	0.184	-0.096	0.117	-0.115	0.302	-0.226	0.124
	C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods	-1.050	0.276			-1.356	0.361						
	D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances	0.000											
	Total	**-0.382**	**0.494**	**-0.290**	**0.478**	**-0.481**	**0.482**	**-0.406**	**0.368**	**-0.186**	**0.427**	**-0.391**	**0.493**
Research	B. Select information from a variety of sources									0.917	0.489		
	Total									**0.917**	**0.489**		
Key Cognitive Strategies	A. Intellectual curiosity							-2.125	0.059	0.250			
	B. Reasoning	-1.182	0.516	-0.861	0.483	-1.250	0.471	-0.226	0.997	-0.712	0.636	-0.988	0.581
	C. Problem solving	-1.986	0.296	-1.634	0.319	-2.019	0.188	-1.833	0.157	-1.813	0.490	-1.702	0.664
	D. Academic behaviors	-0.648	0.398	-0.364	0.352	-0.718	0.340	-0.566	0.451	-0.520	0.450	-0.412	0.418
	E. Work habits							-1.292	0.059				
	F. Academic integrity			0.000	0.000			-1.417	0.642	0.444	0.096	0.500	
	Total	**-1.154**	**0.726**	**-0.800**	**0.674**	**-1.189**	**0.689**	**-0.956**	**0.752**	**-0.987**	**0.789**	**-0.678**	**0.659**
Foundational Skills	A. Reading across the curriculum	-0.492	0.485	-0.405	0.538	-0.569	0.588	-0.456	0.439	-0.667	0.664	-0.613	0.464
	B. Writing across the curriculum	-0.744	0.644	-0.477	0.584	-0.831	0.555	-0.606	0.636	-0.679	0.645	-0.488	0.742

Key Content	Organizing Component	ELA: Difference Between Item and PE Cognitive Demand											
		ACT		ACCUPLACER		ASSET		COMPASS		SAT		THEA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	C. Research across the curriculum							-1.427	0.384				
	D. Use of data							-1.778	0.459			-1.333	
	E. Technology							-0.861	0.674				
	Total	**-0.637**	**0.595**	**-0.442**	**0.562**	**-0.719**	**0.583**	**-0.555**	**0.574**	**-0.674**	**0.652**	**-0.569**	**0.585**

Note: Blank cells indicate no items were aligned on that test with that performance expectation. Standard deviations are not presented for means based on a single item. Counts are provided in the corresponding tables in Appendix D. Organizing components not assessed by test items on any of the tests are not listed in this table.

Appendix C. Total Number of Matches per Test by Organizing Component

Total Matches by Mathematics Test

Key Content	Organizing Component	Mathematics: Total Number of Matches for this Test						
		ACT	ACCU-PLACER	ASSET	COMPASS	SAT	THEA	Total
Numeric Reasoning	A. Number representation	63	127	101	97	36	1	425
	B. Number operations	249	546	1,228	718	129	43	2,913
	C. Number sense and number concepts	21	65	111	63	4	1	265
	Total	**333**	**738**	**1,440**	**878**	**169**	**45**	**3,603**
Algebraic Reasoning	A. Expressions and equations	23	53	74	52	6	6	214
	B. Manipulating expression	236	526	791	479	74	58	2,164
	C. Solving equations, inequalities, and systems of equations	251	311	753	334	110	45	1,804
	D. Representations	669	366	964	1,067	352	209	3,627
	Total	**1179**	**1,256**	**2,582**	**1,932**	**542**	**318**	**7,809**
Geometric Reasoning	A. Figures and their properties	434	129	1,152	614	174	84	2,587
	B. Transformations and symmetry	30	5	42	27	19	7	130
	C. Connections between geometry and other mathematical content strands	433	152	856	551	173	82	2,247
	D. Logic and reasoning in geometry	26		83	25	8	11	153
	Total	**923**	**286**	**2,133**	**1,217**	**374**	**184**	**5,117**
Measurement Reasoning	A. Measurement involving physical and natural attributes	3	7		1	3	2	16
	B. Systems of measurement	15	4	74	12	4	8	117
	C. Measurement involving geometry and algebra	216	61	479	360	75	34	1,225
	D. Measurement involving statistics and probability	1				1	1	3
	Total	**235**	**72**	**553**	**373**	**83**	**45**	**1,361**
Probabilistic Reasoning	A. Counting principles	16	15	10	1	14		56
	B. Computation and interpretation of probabilities	19	7		18	13		57
	Total	**35**	**22**	**10**	**19**	**27**		**113**
Statistical Reasoning	B. Describe data	28	9	34	78	36	27	212
	C. Read, analyze, interpret, and draw conclusions from data	8	14	1	2	32	10	67
	Total	**36**	**23**	**35**	**80**	**68**	**37**	**279**

Key Content	Organizing Component	Mathematics: Total Number of Matches for this Test						
		ACT	ACCU-PLACER	ASSET	COMPASS	SAT	THEA	Total
Functions	A. Recognition and representation of functions	5	29	10	15	1	1	61
	B. Analysis of functions	84	219	392	492	124	22	1,333
	C. Model real-world situations with functions	59	30	59	71	21	22	262
	Total	**148**	**278**	**461**	**578**	**146**	**45**	**1,656**
Problem Solving and Reasoning	A. Mathematical problem solving	1346	716	2,237	2,133	990	422	7,844
	B. Logical reasoning	12	2	14	40	21	23	112
	C. Real-world problem solving	122	7	42	48	25	36	280
	Total	**1480**	**725**	**2,293**	**2,221**	**1,036**	**481**	**8,236**
Communication and Representation	A. Language, terms, and symbols of mathematics	119	52	93	106	23	31	424
	B. Interpretation of mathematical work	385	222	683	668	266	131	2,355
	C. Presentation and representation of mathematical work	9	6	31	11	9	21	87
	Total	**513**	**280**	**807**	**785**	**298**	**183**	**2,866**
Connections	A. Connections among the strands of mathematics	103	54	357	157	58	24	753
	B. Connections of mathematics to nature, real-world situations, and everyday life	106	32	146	65	54	46	449
	Total	**209**	**86**	**503**	**222**	**112**	**70**	**1,202**
Key Cognitive Strategies	A. Intellectual curiosity	1		1				2
	B. Reasoning	1			1		3	5
	C. Problem solving	609	528	1138	766	372	152	3565
	D. Academic behaviors	1				2		3
	Total	**612**	**528**	**1139**	**767**	**374**	**155**	**3,575**
Foundational Skills	A. Reading across the curriculum	262	275	636	471	179	52	1,875
	B. Writing across the curriculum		1					1
	D. Use of data					1	7	8
	E. Technology		1					1
	Total	**262**	**277**	**636**	**471**	**180**	**59**	**1,885**
Overall	**Total**	**5,965**	**4,571**	**12,592**	**9,543**	**3,409**	**1,622**	**37,702**

Note: Blank cells indicate no items from the test assessed performance expectations within the organizing component. Organizing components not assessed by test items on any of the tests are not listed in this table.

Total Matches by ELA Test

Key Content	Organizing Component	ELA: Total Number of Matches for this Test						
		ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA	Total
Writing	A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose	25,03	1,290	1,632	1,528	1,374	502	8,829
	Total	**2,503**	**1,290**	**1,632**	**1,528**	**1,374**	**502**	**8,829**
Reading	A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths	997	518	585	676	393	342	3,511
	B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing	19		38	26	29	14	126
	C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods	10		5				15
	D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances	1						1
	Total	**1,027**	**518**	**628**	**702**	**422**	**356**	**3,653**
Research	B. Select information from a variety of sources					6		6
	Total					**6**		**6**
Key Cognitive Strategies	A. Intellectual curiosity				2	1		3
	B. Reasoning	54	30	5	24	35	27	175
	C. Problem solving	206	83	135	122	114	14	674
	D. Academic behaviors	342	159	238	242	169	81	1,231
	E. Work habits				2			2
	F. Academic integrity		2		4	3	1	10
	Total	**602**	**274**	**378**	**396**	**322**	**123**	**2,095**
Foundational Skills	A. Reading across the curriculum	654	311	395	367	319	231	2,277
	B. Writing across the curriculum	890	327	533	490	439	135	2,814
	C. Research across the curriculum				8			8
	D. Use of data				3		1	4

Key Content	Organizing Component	ELA: Total Number of Matches for this Test						
		ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA	Total
	E. Technology				3			3
	Total	**1,544**	**638**	**928**	**871**	**758**	**367**	**5,106**
Overall	**Total**	**5,676**	**2,720**	**3,566**	**3,497**	**2,882**	**1,348**	**19,689**

Note: Blank cells indicate no items from the test assessed performance expectations within the organizing component. Organizing components not assessed by test items on any of the tests are not listed in this table.

Appendix D. Categorical Concurrence by Test and Performance Expectation

Categorical Concurrence for Mathematical Tests

Key Content	Organizing Component	Performance Expectation	Mathematics: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
Numeric Reasoning	A. Number representation	1. Compare real numbers	1	1	1	1	1	
		2. Define and give examples of complex numbers			1			
	B. Number operations	1. Perform computations with real and complex numbers	1	1	1	1	1	1
	C. Number sense and number concepts	1. Use estimation to check for errors and reasonableness of solutions	1	1	1	1		
Algebraic Reasoning	A. Expressions and equations	1. Explain and differentiate between expressions and equations using words such as solve, evaluate, and simplify	1	1	1	1	1	
	B. Manipulating expression	1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions)	1	1	1	1	1	1
	C. Solving equations, inequalities, and systems of equations	1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations	1	1	1	1	1	1
		2. Explain the difference between the solution set of an equation and the solution set of an inequality		1	1	1	1	
	D. Representations	1. Interpret multiple representations of equations and relationships	1	1	1	1	1	1
		2. Translate among multiple representations of equations and relationships	1	1	1	1	1	1
Geometric Reasoning	A. Figures and their properties	1. Identify and represent the features of plane and space figures	1	1	1	1	1	1
		2. Make, test, and use conjectures about one-, two-, and three-dimensional figures and their properties	1	1	1	1	1	1
		3. Recognize and apply right triangle relationships including basic trigonometry	1	1	1	1		
	B. Transformations and symmetry	1. Identify and apply transformations to figures	1				1	
		2. Identify the symmetries of a plane figure						

Key Content	Organizing Component	Performance Expectation	Mathematics: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
		3. Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures	1		1	1		
	C. Connections between geometry and other mathematical content strands	1. Make connections between geometry and algebra	1	1	1	1	1	1
		2. Make connections between geometry, statistics, and probability						
		3. Make connections between geometry and measurement	1	1	1	1	1	1
	D. Logic and reasoning in geometry	1. Make and validate geometric conjectures	1		1	1		
		2. Understand that Euclidean geometry is an axiomatic system	1		1	1		
Measurement Reasoning	A. Measurement involving physical and natural attributes	1. Select or use the appropriate type of unit for the attribute being measured		1				
	B. Systems of measurement	1. Convert from one measurement system to another			1			
		2. Convert within a single measurement system	1		1			
	C. Measurement involving geometry and algebra	1. Find the perimeter and area of two-dimensional figures	1	1	1	1	1	
		2. Determine the surface area and volume of three-dimensional figures				1		
		3. Determine indirect measurements of figures using scale drawings, similar figures, Pythagorean Theorem, and basic trigonometry	1	1	1	1	1	
	D. Measurement involving statistics and probability	1. Compute and use measures of center and spread to describe data						
		2. Apply probabilistic measures to practical situations to make an informed decision						
Probabilistic Reasoning	A. Counting principles	1. Determine the nature and the number of elements in a finite sample space					1	
	B. Computation and interpretation of probabilities	1. Compute and interpret the probability of an event and its complement						
		2. Compute and interpret the probability of conditional and compound events						

Key Content	Organizing Component	Performance Expectation	Mathematics: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
Statistical Reasoning	B. Describe data	1. Determine types of data						
		2. Select and apply appropriate visual representations of data						
		3. Compute and describe summary statistics of data	1		1	1	1	
		4. Describe patterns and departure from patterns in a set of data					1	
	C. Read, analyze, interpret, and draw conclusions from data	1. Make predictions and draw inferences using summary statistics						
		2. Analyze data sets using graphs and summary statistics					1	
Functions	A. Recognition and representation of functions	1. Recognize whether a relation is a function						
		2. Recognize and distinguish between different types of functions		1	1	1		
	B. Analysis of functions	1. Understand and analyze features of a function	1	1	1	1	1	1
		2. Algebraically construct and analyze new functions	1	1	1	1	1	
	C. Model real-world situations with functions	1. Apply known function models	1	1	1	1	1	1
		2. Develop a function to model a situation	1			1	1	1
Problem Solving and Reasoning	A. Mathematical problem solving	1. Analyze given information	1	1	1	1	1	1
		2. Formulate a plan or strategy	1	1	1	1	1	1
		3. Determine a solution	1	1	1	1	1	1
		4. Justify the solution						
		5. Evaluate the problem solving process	1	1	1	1	1	1
	B. Logical reasoning	1. Develop and evaluate convincing arguments						1
		2. Use various types of reasoning	1		1	1	1	
	C. Real-world problem solving	1. Formulate a solution to a real-world situation based on the solution to a mathematical problem	1	1	1	1	1	1
		2. Use a function to model a real-world situation	1					
		3. Evaluate the problem-solving process	1					
Communication and Representation	A. Language, terms, and symbols of mathematics	2. Use mathematical language to represent and communicate the mathematical concepts in a problem	1	1	1	1	1	1

Key Content	Organizing Component	Performance Expectation	Mathematics: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
		3. Use mathematics as a language for reasoning, problem solving, making connections, and generalizing	1		1	1		
		4. Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem	1	1	1	1	1	1
	B. Interpretation of mathematical work	1. Model and interpret mathematical ideas and concepts using multiple representations	1	1	1	1	1	1
		2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context	1			1		1
	C. Presentation and representation of mathematical work	1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words			1	1	1	1
		2. Create and use representations to organize, record, and communicate mathematical ideas						
		3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications						
Connections	A. Connections among the strands of mathematics	1. Connect and use multiple strands of mathematics in situations and problems	1	1	1	1	1	1
		2. Connect mathematics to the study of other disciplines	1					
	B. Connections of mathematics to nature, real-world situations, and everyday life	1. Use multiple representations to demonstrate links between mathematical and real-world situations	1	1	1	1	1	1
		2. Understand and use appropriate mathematical models in the natural, physical, and social sciences	1					
		3. Know and understand the use of mathematics in a variety of careers and professions.						
Key Cognitive Strategies	A. Intellectual curiosity	1. Engage in scholarly inquiry and dialogue						
	B. Reasoning	1. Consider arguments and conclusions of self and others						
	C. Problem solving	1. Analyze a situation to identify a problem to be solved	1	1	1	1	1	1
		2. Develop and apply multiple strategies to solving a problem.	1	1	1			1

Key Content	Organizing Component	Performance Expectation	Mathematics: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCUPLACER	ASSET	COMPASS	SAT	THEA
		3. Collect evidence and data systematically and directly relate to solving a problem						
	D. Academic behaviors	1. Self-monitor learning needs and seek assistance when needed						
Foundational Skills	A. Reading across the curriculum	1. Use effective prereading strategies						
		3. Identify the intended purpose and audience of the text						
		4. Identify the key information and supporting details	1	1	1	1	1	1
		5. Analyze textual information critically			1			
	B. Writing across the curriculum	1. Write clearly and coherently using standard writing conventions						
	D. Use of data	1. Identify patterns or departures from patterns among data						
		2. Use statistical and probabilistic skills necessary for planning an investigation, and collecting, analyzing, and interpreting data						
		3. Present analyzed data and communicate findings in a variety of formats						
	E. Technology	4. Use technology appropriately						

Note: Zeros indicate the test did not meet the criteria for categorical concurrence within that performance expectation and blank cells indicate that a test did not assess that performance expectation. Performance expectations not assessed by test items on any of the tests are not listed in this table.

Categorical Concurrence for ELA Tests

Key Content	Organizing Component	Performance Expectation	ELA: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCU-PLACER	ASSET	COM-PASS	SAT	THEA
Writing	A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose	1. Determine effective approaches, forms, and rhetorical techniques that demonstrate understanding of the writer's purpose and audience	1	1	1	1	1	1
		2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.	0	1	1	1	0	0
		3. Evaluate relevance, quality, sufficiency, and depth of preliminary ideas and information, organize material generated, and formulate a thesis	1	1	1	1	1	1
		4. Recognize the importance of revision as the key to effective writing (refine key ideas and organize them more logically and fluidly, use language more precisely and effectively, and draw the reader to the author's purpose)	1	1	1	1	1	1
		5. Edit writing for proper voice, tense, and syntax, assuring that it conforms to standard English, when appropriate	1	1	1	1	1	1
Reading	A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths	1. Use effective reading strategies to determine a written work's purpose and intended audience	1	1	1	1	1	1
		2. Use text features and graphics to form an overview of informational texts and to determine where to locate information						0
		3. Identify explicit and implicit textual information including main ideas and authors purpose	1	1	1	1	1	1
		4. Draw and support complex inferences from text to summarize, draw conclusions, and distinguish facts from simple assertions and opinions	1	1	1	1	1	1
		5. Analyze the presentation of information and the strength and quality of evidence used by the author	1	1	1	1	1	1
		6. Analyze imagery in literary texts	1	0			0	
		7. Evaluate the use of both literal and figurative language to inform and shape the perceptions of readers	1	0	0			
		9. Identify and analyze the audience, purpose, and message of an informational or persuasive text	1	1	1	1	1	1
		10. Identify and analyze how an authors use of language appeals to the senses, creates imagery, and suggests mood	1	0				0
		11. Identify, analyze, and evaluate similarities and differences in how multiple texts present information, argue a position, or relate a theme					0	
	B. Understand new vocabulary and concepts and use them	1. Identify new words and concepts acquired through study of their relationships to other words and concepts	1		1	1	1	1

Key Content	Organizing Component	Performance Expectation	ELA: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCU-PLACER	ASSET	COM-PASS	SAT	THEA
	accurately in reading, speaking, and writing							
	C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods	2. Analyze themes, structures, and elements of myths, traditional narratives, and classical and contemporary literature	1		0			
		4. Analyze and compare the use of language in literary works from a variety of world cultures	0					
	D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances	1. Describe insights gained about oneself, others, or the world from reading specific texts	0					
Research	B. Select information from a variety of sources	1. Gather relevant sources					0	
		2. Evaluate the validity and reliability of sources					0	
		3. Synthesize and organize information effectively					0	
Key Cognitive Strategies	A. Intellectual curiosity	1. Engage in scholarly inquiry and dialogue				0	0	
		2. Accept constructive criticism and revise personal views when valid evidence warrants				0		
	B. Reasoning	1. Consider arguments and conclusions of self and others	1	1	0	1	1	1
		2. Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions	0	0		0	0	0
		3. Gather evidence to support arguments, findings, or lines of reasoning	0	0		0	0	0
		4. Support or modify claims based on the results of an inquiry		0		0	0	
	C. Problem solving	1. Analyze a situation to identify a problem to be solved	1	1	1	1	1	1
		2. Develop and apply multiple strategies to solving a problem				0	0	
		3. Collect evidence and data systematically and directly relate to solving a problem		0		0		
	D. Academic behaviors	1. Self-monitor learning needs and seek assistance when needed				0		
		2. Use study habits necessary to manage academic pursuits and requirements				0		
		3. Strive for accuracy and precision	1	1	1	1	1	1

Key Content	Organizing Component	Performance Expectation	ELA: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCU-PLACER	ASSET	COM-PASS	SAT	THEA
		4. Persevere to complete and master tasks				1	0	
	E. Work habits	1. Work independently				0		
		2. Work collaboratively				0		
	F. Academic integrity	1. Attribute ideas and information to source materials and people				0		
		2. Evaluate sources for quality of content, validity, credibility, and relevance				0	0	
		3. Include the ideas of others and the complexities of the debate, issue, or problem		0		0	0	0
		4. Understand and adhere to ethical codes of conduct				0		
Foundational Skills	A. Reading across the curriculum	1. Use effective prereading strategies	1	1	1	1	1	1
		2. Use a variety of strategies to understand the meanings of new words	1		1	1	1	1
		3. Identify the intended purpose and audience of the text	1	1	1	1	1	1
		4. Identify the key information and supporting details	1	1	1	1	1	1
		5. Analyze textual information critically	1	1	1	1	1	1
		6. Annotate, summarize, paraphrase, and outline texts when appropriate				0	0	1
		7. Adapt reading strategies according to structure of texts	1	0	0			
		8. Connect reading to historical and current events and personal interest	0					
	B. Writing across the curriculum	1. Write clearly and coherently using standard writing conventions	1	1	1	1	1	1
		2. Write in a variety of forms for various audiences and purposes	0			0	0	
		3. Compose and revise drafts	1	1	1	1	1	1
	C. Research across the curriculum	1. Understand which topics or questions are to be investigated				0		
		2. Explore a research topic				0		
		3. Refine research topic based on preliminary research and devise a timeline for completing work				0		
		4. Evaluate the validity and reliability of sources				0		
		5. Synthesize and organize information effectively				0		
		6. Design and present an effective product				0		
		7. Integrate source material				0		
		8. Present final product				0		
Foundationa	D. Use of data	1. Identify patterns or departures from patterns among data				0		

Key Content	Organizing Component	Performance Expectation	ELA: Categorical Concurrence for a Unique Number of Items					
			ACT	ACCU-PLACER	ASSET	COM-PASS	SAT	THEA
I Skills		2. Use statistical and probabilistic skills necessary for planning an investigation, and collecting, analyzing, and interpreting data				0		
		3. Present analyzed data and communicate findings in a variety of formats				0		0
	E. Technology	1. Use technology to gather information				0		
		2. Use technology to organize, manage, and analyze information				0		
		3. Use technology to communicate and display findings in a clear and coherent manner				0		

Note: Zeros indicate the test did not meet the criteria for categorical concurrence within that performance expectation and blank cells indicate that a test did not assess that performance expectation Performance expectations not assessed by test items on any of the tests are not listed in this table.

Appendix E. Number of Unique Items Aligned per Test by Performance Expectation

Number of Unique Items Aligned to Each Performance Expectation by Math Test

Key Content	Organizing Component	Performance Expectation	Mathematics: Number of Unique Item Matches for this Performance Expectation by Test					
			ACCU-PLACER	ACT	ASSET	COMP-ASS	SAT	THEA
Numeric Reasoning	A. Number representation	1. Compare real numbers	37	30	50	47	18	1
		2. Define and give examples of complex numbers	3	1	8	2	1	0
	B. Number operations	1. Perform computations with real and complex numbers	173	137	499	274	73	23
	C. Number sense and number concepts	1. Use estimation to check for errors and reasonableness of solutions	47	18	108	61	4	1
Algebraic Reasoning	A. Expressions and equations	1. Explain and differentiate between expressions and equations using words such as solve, evaluate, and simplify	53	23	74	51	6	5
	B. Manipulating expression	1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions)	149	83	258	178	37	14
	C. Solving equations, inequalities, and systems of equations	1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations	99	121	296	147	49	12
		2. Explain the difference between the solution set of an equation and the solution set of an inequality	7	1	16	7	7	0
	D. Representations	1. Interpret multiple representations of equations and relationships	76	121	169	192	75	34
		2. Translate among multiple representations of equations and relationships	72	119	204	195	74	31
Geometric Reasoning	A. Figures and their properties	1. Identify and represent the features of plane and space figures	34	80	165	93	37	18
		2. Make, test, and use conjectures about one-, two-, and three-dimensional figures and their properties	16	64	157	89	33	17
		3. Recognize and apply right triangle relationships including basic trigonometry	17	24	64	66	4	2
	B. Transformations and symmetry	1. Identify and apply transformations to figures	3	6	0	5	6	0
		2. Identify the symmetries of a plane figure	0	1	3	0	4	0
		3. Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures	0	8	30	14	4	4

Key Content	Organizing Component	Performance Expectation	Mathematics: Number of Unique Item Matches for this Performance Expectation by Test					
			ACCU-PLACER	ACT	ASSET	COMP-ASS	SAT	THEA
	C. Connections between geometry and other mathematical content strands	1. Make connections between geometry and algebra	38	79	159	108	35	12
		2. Make connections between geometry, statistics, and probability	0	0	0	0	4	0
		3. Make connections between geometry and measurement	15	74	140	92	25	11
	D. Logic and reasoning in geometry	1. Make and validate geometric conjectures	0	10	37	15	4	4
		2. Understand that Euclidean geometry is an axiomatic system	0	10	40	9	4	4
Measurement Reasoning	A. Measurement involving physical and natural attributes	1. Select or use the appropriate type of unit for the attribute being measured	6	3	0	1	2	2
	B. Systems of measurement	1. Convert from one measurement system to another	1	3	18	2	1	1
		2. Convert within a single measurement system	2	6	19	5	1	5
	C. Measurement involving geometry and algebra	1. Find the perimeter and area of two-dimensional figures	7	24	45	42	11	5
		2. Determine the surface area and volume of three-dimensional figures	0	4	0	6	2	4
		3. Determine indirect measurements of figures using scale drawings, similar figures, Pythagorean Theorem, and basic trigonometry	16	51	121	87	19	4
	D. Measurement involving statistics and probability	1. Compute and use measures of center and spread to describe data	0	0	0	0	0	1
		2. Apply probabilistic measures to practical situations to make an informed decision	0	1	0	0	1	0
Probabilistic Reasoning	A. Counting principles	1. Determine the nature and the number of elements in a finite sample space	4	5	2	1	7	0
	B. Computation and interpretation of probabilities	1. Compute and interpret the probability of an event and its complement	2	4	0	3	4	0
		2. Compute and interpret the probability of conditional and compound events	0	2	0	0	1	0
Statistical Reasoning	B. Describe data	1. Determine types of data	0	0	0	0	0	1
		2. Select and apply appropriate visual representations of data	1	1	1	2	1	3
		3. Compute and describe summary statistics of data	1	7	11	17	7	4
		4. Describe patterns and departure from patterns in a set of data	3	2	0	2	8	5
	C. Read, analyze, interpret, and draw conclusions from data	1. Make predictions and draw inferences using summary statistics	4	4	0	2	4	2
		2. Analyze data sets using graphs and summary statistics	5	4	1	0	13	4
Functions	A. Recognition and	1. Recognize whether a relation is a function	3	1	0	4	1	0

Key Content	Organizing Component	Performance Expectation	Mathematics: Number of Unique Item Matches for this Performance Expectation by Test					
			ACCU-PLACER	ACT	ASSET	COMP-ASS	SAT	THEA
	representation of functions	2. Recognize and distinguish between different types of functions	19	4	10	9	0	1
	B. Analysis of functions	1. Understand and analyze features of a function	59	45	118	129	40	14
		2. Algebraically construct and analyze new functions	23	13	31	51	19	3
	C. Model real-world situations with functions	1. Apply known function models	25	39	53	59	9	8
		2. Develop a function to model a situation	4	11	5	7	8	8
Problem Solving and Reasoning	A. Mathematical problem solving	1. Analyze given information	101	144	245	285	90	51
		2. Formulate a plan or strategy	101	143	242	285	90	48
		3. Determine a solution	100	142	243	282	90	51
		4. Justify the solution	0	1	0	1	0	0
		5. Evaluate the problem solving process	62	70	221	156	73	33
	B. Logical reasoning	1. Develop and evaluate convincing arguments	1	2	3	3	2	6
		2. Use various types of reasoning	1	7	11	29	8	4
	C. Real-world problem solving	1. Formulate a solution to a real-world situation based on the solution to a mathematical problem	6	52	40	38	21	18
		2. Use a function to model a real-world situation	1	16	0	2	2	5
		3. Evaluate the problem-solving process	0	25	0	3	1	4
Communication and Representation	A. Language, terms, and symbols of mathematics	2. Use mathematical language to represent and communicate the mathematical concepts in a problem	17	40	27	29	6	9
		3. Use mathematics as a language for reasoning, problem solving, making connections, and generalizing	2	10	6	13	2	3
		4. Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem	25	56	40	54	14	13
	B. Interpretation of mathematical work	1. Model and interpret mathematical ideas and concepts using multiple representations	80	119	236	193	86	39
		2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context	3	33	0	6	3	8
	C. Presentation and representation of mathematical work	1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words	5	5	31	11	9	15
		2. Create and use representations to organize, record, and communicate mathematical ideas	1	3	0	0	0	1

Key Content	Organizing Component	Performance Expectation	Mathematics: Number of Unique Item Matches for this Performance Expectation by Test					
			ACCU-PLACER	ACT	ASSET	COMP-ASS	SAT	THEA
		3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications	0	1	0	0	0	1
Connections	A. Connections among the strands of mathematics	1. Connect and use multiple strands of mathematics in situations and problems	45	72	176	106	40	19
		2. Connect mathematics to the study of other disciplines	0	7	0	3	0	2
	B. Connections of mathematics to nature, real-world situations, and everyday life	1. Use multiple representations to demonstrate links between mathematical and real-world situations	22	70	79	51	36	23
		2. Understand and use appropriate mathematical models in the natural, physical, and social sciences	1	6	1	1	2	3
		3. Know and understand the use of mathematics in a variety of careers and professions	0	2	0	0	0	2
Key Cognitive Strategies	A. Intellectual curiosity	1. Engage in scholarly inquiry and dialogue	0	1	1	0	0	0
	B. Reasoning	1. Consider arguments and conclusions of self and others	0	1	0	1	0	3
	C. Problem solving	1. Analyze a situation to identify a problem to be solved	248	180	528	348	100	51
		2. Develop and apply multiple strategies to solving a problem	39	52	54	3	4	9
		3. Collect evidence and data systematically and directly relate to solving a problem	0	0	0	0	0	1
	D. Academic behaviors	1. Self-monitor learning needs and seek assistance when needed	0	1	0	0	2	0
Foundational Skills	A. Reading across the curriculum	1. Use effective prereading strategies	0	1	0	0	0	0
		3. Identify the intended purpose and audience of the text	0	1	1	0	0	0
		4. Identify the key information and supporting details	244	175	523	348	100	32
		5. Analyze textual information critically	0	0	6	5	2	2
	B. Writing across the curriculum	1. Write clearly and coherently using standard writing conventions	1	0	0	0	0	0
	D. Use of data	1. Identify patterns or departures from patterns among data	0	0	0	0	1	4
		2. Use statistical and probabilistic skills necessary for planning an investigation, and collecting, analyzing, and interpreting data	0	0	0	0	0	2
		3. Present analyzed data and communicate findings in a variety of formats	0	0	0	0	0	1
	E. Technology	4. Use technology appropriately	1	0	0	0	0	0

Note: Performance expectations not assessed by test items on any of the tests are not listed in this table.

Number of Unique Items Aligned to Each Performance Expectation by ELA Test

Key Content	Organizing Component	Performance Expectation	ELA: Number of Unique Item Matches for this Performance Expectation by Test					
			ACCU-PLACER	ACT	ASSET	COMP-ASS	SAT	THEA
Writing	A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose	1. Determine effective approaches, forms, and rhetorical techniques that demonstrate understanding of the writer's purpose and audience	154	142	51	37	153	39
		2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.	11	4	6	25	3	1
		3. Evaluate relevance, quality, sufficiency, and depth of preliminary ideas and information, organize material generated, and formulate a thesis	111	183	112	136	56	68
		4. Recognize the importance of revision as the key to effective writing (refine key ideas and organize them more logically and fluidly, use language more precisely and effectively, and draw the reader to the author's purpose)	156	341	225	218	164	78
		5. Edit writing for proper voice, tense, and syntax, assuring that it conforms to standard English, when appropriate	93	237	144	153	125	78
Reading	A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths	1. Use effective reading strategies to determine a written work's purpose and intended audience	72	155	108	121	66	51
		2. Use text features and graphics to form an overview of informational texts and to determine where to locate information	0	0	0	0	0	1
		3. Identify explicit and implicit textual information including main ideas and authors purpose	80	147	98	121	67	56
		4. Draw and support complex inferences from text to summarize, draw conclusions, and distinguish facts from simple assertions and opinions	64	74	50	22	42	19
		5. Analyze the presentation of information and the strength and quality of evidence used by the author	41	95	40	8	13	38
		6. Analyze imagery in literary texts	2	8	0	0	1	0
		7. Evaluate the use of both literal and figurative language to inform and shape the perceptions of readers	2	10	2	0	0	0
	A. Locate explicit textual information and draw complex inferences, analyze,	9. Identify and analyze the audience, purpose, and message of an informational or persuasive text	22	87	19	55	24	25
		10. Identify and analyze how an authors use of language appeals to the senses, creates imagery, and suggests mood	1	6	0	0	0	1

Key Content	Organizing Component	Performance Expectation	ELA: Number of Unique Item Matches for this Performance Expectation by Test					
			ACCU-PLACER	ACT	ASSET	COMP-ASS	SAT	THEA
	and evaluate the information within and across texts of varying lengths cont.	11. Identify, analyze, and evaluate similarities and differences in how multiple texts present information, argue a position, or relate a theme	0	0	0	0	2	0
	B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.	1. Identify new words and concepts acquired through study of their relationships to other words and concepts	0	9	16	14	25	7
	C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods.	2. Analyze themes, structures, and elements of myths, traditional narratives, and classical and contemporary literature.	0	9	5	0	0	0
		4. Analyze and compare the use of language in literary works from a variety of world cultures.	0	1	0	0	0	0
	D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances.	1. Describe insights gained about oneself, others, or the world from reading specific texts.	0	1	0	0	0	0
Research	B. Select information from a variety of sources.	1. Gather relevant sources.	0	0	0	0	2	0
		2. Evaluate the validity and reliability of sources	0	0	0	0	2	0
		3. Synthesize and organize information effectively	0	0	0	0	2	0
Key Cognitive Strategies	A. Intellectual curiosity	1. Engage in scholarly inquiry and dialogue	0	0	0	1	1	0
		2. Accept constructive criticism and revise personal views when valid evidence warrants	0	0	0	1	0	0
	B. Reasoning	1. Consider arguments and conclusions of self and others	20	49	5	6	25	23
		2. Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions	2	3	0	5	2	1
		3. Gather evidence to support arguments, findings, or lines of reasoning	2	2	0	5	2	1
		4. Support or modify claims based on the results of an inquiry	2	0	0	5	2	0

Key Content	Organizing Component	Performance Expectation	ELA: Number of Unique Item Matches for this Performance Expectation by Test					
			ACCU-PLACER	ACT	ASSET	COMP-ASS	SAT	THEA
	C. Problem solving	1. Analyze a situation to identify a problem to be solved	82	205	134	120	111	14
		2. Develop and apply multiple strategies to solving a problem	0	0	0	1	2	0
		3. Collect evidence and data systematically and directly relate to solving a problem	1	0	0	1	0	0
	D. Academic behaviors	1. Self-monitor learning needs and seek assistance when needed	0	0	0	1	0	0
		2. Use study habits necessary to manage academic pursuits and requirements	0	0	0	1	0	0
		3. Strive for accuracy and precision	159	342	238	233	167	81
		4. Persevere to complete and master tasks	0	0	0	6	2	0
	E. Work habits	1. Work independently	0	0	0	1	0	0
		2. Work collaboratively	0	0	0	1	0	0
	F. Academic integrity	1. Attribute ideas and information to source materials and people	0	0	0	1	0	0
		2. Evaluate sources for quality of content, validity, credibility, and relevance	0	0	0	1	1	0
		3. Include the ideas of others and the complexities of the debate, issue, or problem	2	0	0	1	2	1
		4. Understand and adhere to ethical codes of conduct	0	0	0	1	0	0
Foundational Skills	A. Reading across the curriculum	1. Use effective prereading strategies	37	65	68	71	26	9
		2. Use a variety of strategies to understand the meanings of new words	0	11	16	15	11	7
		3. Identify the intended purpose and audience of the text	42	101	22	22	24	27
		4. Identify the key information and supporting details	75	143	95	118	65	44
		5. Analyze textual information critically	66	123	92	41	128	63
		6. Annotate, summarize, paraphrase, and outline texts when appropriate	0	0	0	2	1	7
		7. Adapt reading strategies according to structure of texts	2	82	1	0	0	0
		8. Connect reading to historical and current events and personal interest	0	1	0	0	0	0
	B. Writing across the curriculum	1. Write clearly and coherently using standard writing conventions	82	228	141	127	119	39
		2. Write in a variety of forms for various audiences and purposes	0	3	0	2	1	0

Key Content	Organizing Component	Performance Expectation	ELA: Number of Unique Item Matches for this Performance Expectation by Test					
			ACCU-PLACER	ACT	ASSET	COMP-ASS	SAT	THEA
		3. Compose and revise drafts	82	227	141	126	119	39
	C. Research across the curriculum	1. Understand which topics or questions are to be investigated	0	0	0	1	0	0
		2. Explore a research topic	0	0	0	1	0	0
		3. Refine research topic based on preliminary research and devise a timeline for completing work	0	0	0	1	0	0
		4. Evaluate the validity and reliability of sources	0	0	0	1	0	0
		5. Synthesize and organize information effectively	0	0	0	1	0	0
		6. Design and present an effective product	0	0	0	1	0	0
		7. Integrate source material	0	0	0	1	0	0
		8. Present final product	0	0	0	1	0	0
	D. Use of data	1. Identify patterns or departures from patterns among data	0	0	0	1	0	0
		2. Use statistical and probabilistic skills necessary for planning an investigation, and collecting, analyzing, and interpreting data	0	0	0	1	0	0
		3. Present analyzed data and communicate findings in a variety of formats	0	0	0	1	0	1
	E. Technology	1. Use technology to gather information	0	0	0	1	0	0
		2. Use technology to organize, manage, and analyze information	0	0	0	1	0	0
		3. Use technology to communicate and display findings in a clear and coherent manner	0	0	0	1	0	0

Note: Performance expectations not assessed by test items on any of the tests are not listed in this table

This document produced by the Educational Policy Improvement Center

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Attachment 4i

State Board Action to Revise Mathematics Standards in 2012

Minutes
State Board of Education
April 20, 2012

The State Board of Education met at 9:50 a.m. on Friday, April 20, 2012, in the State Board of Education Room, #1-104, of the William B. Travis Building, 1701 N. Congress Avenue, Austin, Texas. The following members of the board were present:

Presiding: Barbara Cargill, Chair; Lawrence A. Allen, Jr.; David Bradley; George Clayton; Bob Craig, Vice Chair; Marsha Farney; Charlie Garza; Pat Hardy; Mavis B. Knight; Terri Leo; Gail Lowe; Ken Mercer; Thomas Ratliff; Michael Soto

Absent: Mary Helen Berlanga

Student Performance

The student performance was provided by Grand Prairie High School Speech and Debate Team, Grand Prairie Independent School District.

Pledge of Allegiance

Approval of Minutes

State Board of Education, January 27, 2012

MOTION AND VOTE: *The State Board of Education unanimously approved the Minutes of the January 27, 2012, meeting of the State Board of Education, as printed.*

Public Testimony - Individual testimony will be taken to address items other than those on the board agenda. The procedures for registering and taking public testimony at State Board of Education committee meetings and general board meetings are provided at **http://www.tea.state.tx.us/index4.aspx?id=2147497741** or in the information section (yellow pages) of the agenda.

There was one presentation of public testimony, as follows:

NAME:	Carolyn Morris
AFFILIATION:	Parent-to-Parent Connection Advocacy, Inc. (PPCA)
TOPIC:	Advocacy for children who receive special education in Admission, Review and Dismissal (ARD) meetings and Due Process Hearings (DPH)

1. Resolutions and Presentations

Kathlyn Christian Gilliam

Mrs. Knight read a resolution, which the State Board of Education adopted by unanimous consent, in memory of Kathlyn Christian Gilliam.

(ATTACHMENT 1, page 13)

2. Approval of Consent Agenda

Any agenda item may be placed on the consent agenda by any State Board of Education committee. The State Board of Education may elect to take separate action on any item on the consent agenda.

In addition to the items on the original consent agenda, the following item received unanimous approval in committee and was brought forward for board approval:

- Official Agenda Item #10—Action on Authorized Generation 16 Charter – The Pro-Vision Academy

By unanimous consent, the State Board of Education approved the following items on the consent agenda, including the item that was brought forward.

(1) Proposed Amendment to 19 TAC Chapter 74, Curriculum Requirements, Subchapter C, Other Provisions, §74.36, Requirements for Elective Courses on the Bible's Hebrew Scriptures (Old Testament) and New Testament and Their Impact on the History and Literature of Western Civilization
(First Reading and Filing Authorization)
(Board agenda page II-1)
(COMMITTEE ON INSTRUCTION)

The State Board of Education approved for first reading and filing authorization the proposed amendment to 19 TAC Chapter 74, Curriculum Requirements, Subchapter C, Other Provisions, §74.36, Requirements for Elective Courses on the Bible's Hebrew Scriptures (Old Testament) and New Testament and Their Impact on the History and Literature of Western Civilization, as recommended by the Committee on Instruction.

(2) Proposed Repeal of 19 TAC Chapter 126, Texas Essential Knowledge and Skills for Technology Applications, Subchapter A, Elementary, §§126.1-126.3, Subchapter B, Middle School, §126.11 and §126.12, and Subchapter C, High School, §§126.21-126.29
(First Reading and Filing Authorization)
(Board agenda page II-13)
(COMMITTEE ON INSTRUCTION)

The State Board of Education approved for first reading and filing authorization the proposed repeal of 19 TAC Chapter 126, Texas Essential Knowledge and Skills for Technology Applications, Subchapter A, Elementary, §§126.1-126.3, Subchapter B, Middle School, §126.11 and §126.12, and Subchapter C, High School, §§126.21-126.29, as recommended by the Committee on Instruction.

(3) Recommendation Regarding Readoption of Instructional Materials
(Board agenda page II-17)
(COMMITTEE ON INSTRUCTION)

The State Board of Education readopted instructional materials currently under contract in the subject areas and for the periods and pricing indicated in the attachment, as recommended by the Committee of Instruction.

(ATTACHMENT 2, page 15)

(4) Adoption of Review of 19 TAC Chapter 129, Student Attendance, Subchapter A, Student Attendance Allowed, and Subchapter B, Student Attendance Accounting
(Adoption of Review)
(Board agenda page III-1)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education adopted the review of 19 TAC Chapter 129, Student Attendance, Subchapter A, Student Attendance Allowed, and Subchapter B, Student Attendance Accounting, as recommended by the Committee on School Finance/Permanent School Fund.

(5) Ratification of the Purchases and Sales of the Investment Portfolio of the Permanent School Fund for the Months of December 2011, January and February 2012
(Board agenda page III-19)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education ratified the purchases and sales for the months of December 2011, January and February 2012 in the amount of $1,117,381,271 and $991,332,469, respectively, as recommended by the Committee on School Finance/Permanent School Fund.

(6) Authorization to Issue a Request for Qualifications (RFQ) for Fiduciary Counsel, Alternative Assets Portfolio/Contracting and Tax Counsel for the Permanent School Fund
(Board agenda page III-21)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education approved the issuance of a Request for Qualifications (RFQ) for Fiduciary Counsel, Alternative Assets Portfolio/Contracting and Tax Counsel for the Permanent School Fund with changes incorporated, as recommended by the Committee on School Finance/Permanent School Fund.

(7) Decision on Real Estate Investments
(Board agenda page III-51)
(COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND)

The State Board of Education approved the execution of agreement(s) with Niam AB, necessary to make an investment commitment of up to €40 million in NIAM Nordic V, L.P., a euro denominated fund, subject to continued due diligence and negotiation of fund terms, and also, approved the relationship with Greenhill & Co., L.L.C., after determining it meets the standards of 19 TAC Chapter 33, Section 33.5(j)(5), which has been disclosed in writing, as recommended by the Committee on School Finance/Permanent School Fund.

(8) Recommendation for Appointment to the Lackland Independent School District Board of Trustees
(Board agenda page IV-1)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education approved the appointment of Mr. Clifford Dietert, to serve a two-year term of office, from April 20, 2012 through April 19, 2014, on the Lackland Independent School District Board of Trustees, as recommended by the Committee on School Initiatives.

(ATTACHMENT 3, page 19)

(9) Recommendation for Appointments to the Fort Sam Houston Independent School District Board of Trustees
(Board agenda page IV-21)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education approved the reappointment of Ms. Anita Jeanne Warren, and the appointment of Dr. Eustace Lewis to each serve a two-year term of office, from April 20, 2012 through April 19, 2014, on the Fort Sam Houston Independent School District Board of Trustees, as recommended by the Committee on School Initiatives.

(ATTACHMENT 4, page 23)

(10) Adoption of Review of 19 TAC Chapter 100, Charters, Subchapter A, Open-Enrollment Charter Schools, and Subchapter B, Home-Rule School District Charters
(Adoption of Review)
(Board agenda page IV-65)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education adopted the review of 19 TAC Chapter 100, Charters, Subchapter A, Open-Enrollment Charter Schools, and Subchapter B, Home-Rule School District Charters, as recommended by the Committee on School Initiatives.

10. Action on Authorized Generation 16 Charter – The Pro-Vision Academy
(Board agenda page IV-63)
(COMMITTEE ON SCHOOL INITIATIVES)

The State Board of Education approved rescinding its contingent authorization for a charter to be operated by Pro Vision Educational Services, Inc., as recommended by the Committee on School Initiatives.

COMMITTEE OF THE FULL BOARD

3. Review of the Report on Permanent School Fund Percentage Distribution Rates Under Consideration for Fiscal Years 2014 and 2015
(Board agenda page I-1)

MOTION: *It was moved by Mr. Craig that the percentage distribution rate to the Available School Fund from the Permanent School Fund for fiscal years 2014 and 2015 shall be between 3.0% and 3.5%, as recommended by the Committee of the Full Board.*

MOTION AND VOTE: *It was moved by Mr. Craig and carried to amend the motion as follows: The percentage distribution rate to the Available School Fund from the Permanent School Fund for fiscal years 2014 and 2015 shall be between 3.0% and 3.5% subject to, and based upon, the assumption that the Permanent School Fund (PSF) receives $130 million per year, or $260 million for the biennium, from the General Land Office (GLO).*

VOTE: *A vote was taken on the motion, as amended. The motion carried.*

4. **Proposed Revisions to 19 TAC Chapter 111, Texas Essential Knowledge and Skills for Mathematics, Subchapter A, Elementary, Subchapter B, Middle School, Subchapter C, High School, and Subchapter D, Other High School Mathematics Courses**
(Second Reading and Final Adoption)
(Board agenda page I-5)

MOTION AND VOTE: *The State Board of Education, by an affirmative vote of two-thirds of the members of the board, approved for second reading and final adoption the proposed revisions to 19 TAC Chapter 111, Texas Essential Knowledge and Skills for Mathematics, Subchapter A, Elementary, Subchapter B, Middle School, Subchapter C, High School, and Subchapter D, Other High School Mathematics Courses, with an effective date of 20 days after filing as adopted with the Texas Register, as recommended by the Committee of the Full Board.*

(ATTACHMENT 5, page 31)

5. **Proposed Revisions to 19 TAC Chapter 66, State Adoption and Distribution of Instructional Materials**
(Second Reading and Final Adoption)
(Board agenda page I-71)

MOTION: *It was moved by Mr. Craig that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 66, State Adoption and Distribution of Instructional Materials, Subchapter A, General Provisions; Subchapter B, State Adoption of Instructional Materials; Subchapter C, Local Operations; Subchapter D, Special Instructional Materials; and Subchapter E, Disposition of Instructional Materials, with an effective date of 20 days after filing as adopted with the Texas Register, as recommended by the Committee of the Full Board.*

MOTION: *It was moved by Mrs. Knight to amend §66.54(i), as follows:*

(i) A publisher shall provide a list of all corrections necessary to each student and teacher component of an instructional materials submission. The list must be in a format designated by the commissioner of education and filed [~~of all factual errors~~] on or before the deadline specified in the schedule of adoption procedures. If no corrections are necessary, the publisher shall file a letter stating this on or before the deadline in the schedule for submitting the list of corrections. On or before the deadline for submitting lists of corrections, publishers shall submit certification that all instructional materials have been edited for accuracy, content, and compliance with requirements of the proclamation.

MOTION: *It was moved by Mr. Ratliff and seconded by Dr. Farney to amend §66.54(i), as follows:*

(i) A publisher shall provide a list of all corrections necessary to each student and teacher component of an instructional materials submission. The list must be in a format approved [~~designated~~] by the commissioner of education and filed on or before the deadline specified in the schedule of adoption procedures. If no corrections are necessary, the publisher shall file a letter stating this on or before the deadline in the schedule for submitting the list of corrections. On or before the deadline for submitting lists of corrections, publishers shall submit certification that all instructional materials have been edited for accuracy, content, and compliance with requirements of the proclamation.

Mr. Ratliff withdrew his motion, with no objection.

MOTION AND VOTE: *It was moved by Mr. Craig and seconded by Mr. Clayton to amend §66.54 (i), as follows:*

(i) A publisher shall provide a list of [~~all~~] corrections of all factual errors necessary to each student and teacher component of an instructional materials submission. The list must be in a format designated [~~approved~~] by the commissioner of education and filed on or before the deadline specified in the schedule of adoption procedures. If no corrections are necessary, the publisher shall file a letter stating this on or before the deadline in the schedule for submitting the list of corrections. On or before the deadline for submitting lists of corrections, publishers shall submit certification that all instructional materials have been edited for accuracy, content, and compliance with requirements of the proclamation.

The motion failed.

VOTE: *A vote was taken on Mrs. Knight's original motion. The motion carried.*

MOTION AND VOTE: *It was moved by Dr. Soto and seconded by Mr. Craig to amend §66.27(c), §66.36(a)(1), §66.51(a)(9), as follows:*

The proclamation shall require the instructional materials submitted in response to the proclamation to cover at least 50% of the specific essential knowledge and skills for the subject area and grade level for which the materials are intended at least once in the student text narrative or its electronic equivalent and once in either the student text narrative or an end-of-section review exercise, an end-of-chapter activity or a unit test or their electronic equivalents.

The motion failed, with 1 member voting Aye and 13 members voting No, as follows:

Aye:	*Dr. Soto*	
No:	*Mr. Allen*	*Ms. Hardy*
	Mr. Bradley	*Mrs. Knight*
	Mrs. Cargill	*Ms. Leo*
	Mr. Clayton	*Mrs. Lowe*
	Mr. Craig	*Mr. Mercer*
	Dr. Farney	*Mr. Ratliff*
	Mr. Garza	

VOTE: *A vote was taken on the motion that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption the proposed revisions to 19 TAC Chapter 66, State Adoption and Distribution of Instructional Materials, Subchapter A, General Provisions; Subchapter B, State Adoption of Instructional Materials; Subchapter C, Local Operations; Subchapter D, Special Instructional Materials; and Subchapter E, Disposition of Instructional Materials, with an effective date of 20 days after filing as adopted with the Texas Register, as amended. The motion carried.*

(ATTACHMENT 6, page 93)

MOTION AND VOTE: *It was moved by Mr. Craig and carried unanimously that the State Board of Education approve for first reading and filing authorization the proposed amendment to 19 TAC §66.24, Review and Renewal of Contracts; proposed repeal of 19 TAC §66.69, Ancillary Materials, and proposed new 19 TAC §66.79, Adding Content During the Review and Adoption Process, as recommended by the Committee of the Full Board.*

~~§66.24. Review and Renewal of Contracts.~~

~~(c) Publishers awarded new contracts shall be prepared to make the adopted instructional materials available for at least one extended contract period of not more than four years at prices that are mutually agreeable to publishers and to the commissioner of education [approves]. The SBOE may consider refusing to award future contracts to a publisher who, after receiving written notice to do so, refuses to rebid instructional materials at least one time. Failure of a publisher to negotiate an acceptable price for an extended contract shall not be considered failure to rebid instructional materials.~~

~~§66.69. Ancillary Materials.~~

~~(a) "Ancillary materials" are defined by the Texas Education Agency (TEA) as materials that are not listed on the publisher's intent to bid statement but which the publisher plans to provide to districts and open-enrollment charter schools free with their order. A publisher of adopted instructional materials shall provide any ancillary item free of charge or at the same price discount to the same extent that the publisher provides the item free of charge or at a price discount to any state, public school, or school district in the United States. Free or discounted price ancillary items will be distributed equitably to all school districts and open-enrollment charter schools regardless of size. The title of each ancillary item that a publisher will make available to school districts and open-enrollment charter schools at no charge and the ratio at which each item shall be supplied shall be filed with the TEA according to the schedule contained in the proclamation. A publisher must notify TEA of any ancillaries provided to school districts and open-enrollment charter schools that are not listed with TEA. All packages of ancillary materials shipped to school districts and open-enrollment charter schools shall be labeled, "Ancillary Materials -- Not Reviewed by the State Board of Education."~~

~~(b) Three dimensional ancillary materials, designed for use as manipulatives in prekindergarten systems that cannot be produced in a digital or web-based format shall not be required to be provided electronically. This subsection shall be implemented beginning with Proclamation 2011.~~

~~(c) Designated ancillaries shall be made available to the State Board of Education (SBOE) upon request. Individual SBOE members are not authorized to act on behalf of the SBOE in requesting and making changes to supplemental or ancillary materials.~~

~~§66.79. Adding Content During the Review and Adoption Process.~~

~~A publisher may add content to an instructional material during the review and adoption process only to allow the material to meet the percentage of TEKS the publisher had specified the material covered.~~

6. Proclamation 2014 of the State Board of Education Advertising for Bids on Instructional Materials
(Board agenda page I-101)

MOTION: *It was moved by Mr. Craig to adopt Proclamation 2014 of the State Board of Education Advertising for Bids on Instructional Materials, as recommended by the Committee of the Full Board.*

MOTION AND VOTE: *It was moved by Mr. Allen, seconded by Mr. Bradley, and carried that the materials for the Spanish version of the mathematics TEKS be due to the Agency on May 17, 2013.*

VOTE: *A vote was taken on the motion to adopt Proclamation 2014 of the State Board of Education Advertising for Bids on Instructional Materials, as amended. The motion carried unanimously. (Ms. Leo was absent for the vote.)*

(ATTACHMENT 7, page 119)

COMMITTEE ON INSTRUCTION

The Committee on Instruction had no action items.

COMMITTEE ON SCHOOL FINANCE/PERMANENT SCHOOL FUND

7. Proposed Amendment to 19 TAC Chapter 129, Student Attendance, Subchapter B, Student Attendance Accounting, §129.21, Requirements for Student Attendance Accounting for State Funding Purposes
(First Reading and Filing Authorization)
(Board agenda page III-9)

MOTION AND VOTE: *It was moved by Ms. Hardy and carried unanimously to approve for first reading and filing authorization the proposed amendment to 19 TAC Chapter 129, Student Attendance, Subchapter B, Student Attendance Accounting, §129.21, Requirements for Student Attendance Accounting for State Funding Purposes, as recommended by the Committee on School Finance/Permanent School Fund. (Ms. Leo was absent for the vote.)*

8. Proposed Amendments to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund
(Second Reading and Final Adoption)
(Board agenda page III-23)

MOTION AND VOTE: *It was moved by Ms. Hardy and carried unanimously that the State Board of Education, by an affirmative vote of two-thirds of the members of the board, approve for second reading and final adoption, the proposed amendments to 19 TAC Chapter 33, Statement of Investment Objectives, Policies, and Guidelines of the Texas Permanent School Fund, with an effective date of 20 days after filing as adopted with the Texas Register, as recommended by the Committee on School Finance/Permanent School Fund. (Ms. Leo was absent for the vote.)*

(ATTACHMENT 8, page 161)

9. Approval of One or More Strategic Relationships from the Current Absolute Return Fund of Hedge Fund Investment Managers for the Permanent School Fund
(Board agenda page III-53)

MOTION: *It was moved by Ms. Hardy and seconded by Mr. Ratliff that the State Board of Education enter into an absolute return strategic relationship with Grosvenor Capital Management, L.P. and Blackstone Alternative Asset Management, L.P., as recommended by the Committee on School Finance/Permanent School Fund.*

MOTION: *It was moved by Mr. Bradley and seconded by Mr. Garza that the State Board of Education postpone indefinitely this item.*

Mr. Bradley withdrew his motion, without objection.

MOTION: *It was moved by Mr. Bradley to amend the motion by striking Grosvenor Capital Management, L.P.*

The motion died for lack of a second.

MOTION AND VOTE: *It was moved by Mr. Bradley and seconded by Mr. Garza to amend the motion by adding at the end of the sentence, the following language, "Implementation of the strategic group relationship cannot be executed until the State Board of Education gets legal authority from the Attorney General." The motion failed.*

VOTE: *A vote was taken on the motion that the State Board of Education enter into an absolute return strategic relationship with Grosvenor Capital Management, L.P. and Blackstone Alternative Asset Management, L.P. The motion carried, with 9 members voting Aye and 5 members voting No, as follows:*

Aye:	*Mr. Allen*	*Mrs. Knight*
	Mr. Clayton	*Mrs. Lowe*
	Mr. Craig	*Mr. Ratliff*
	Dr. Farney	*Dr. Soto*
	Ms. Hardy	
No:	*Mr. Bradley*	*Ms. Leo*
	Mrs. Cargill	*Mr. Mercer*
	Mr. Garza	

COMMITTEE ON SCHOOL INITIATIVES

10. Action on Authorized Generation 16 Charter – The Pro-Vision Academy
(Board agenda page IV-63)

Action taken by the State Board of Education is addressed under agenda item #2—Approval of Consent Agenda.

REPORTS OF COMMITTEES REGARDING AGENDA ITEMS ON COMMITTEE AGENDAS

Committee on Instruction

Mr. Clayton did not report on Committee on Instruction discussion items.

Committee on School Finance/Permanent School Fund

Ms. Hardy did not report on Committee on School Finance/Permanent School Fund discussion items.

Committee on School Initiatives

Mr. Mercer reported on the action item of the Committee on School Initiatives, Review of Open-Enrollment Charter Schools Applications Removed from Consideration for Incompleteness.

REPORTS OF OTHER STATE BOARD OF EDUCATION MEMBERS REGARDING AGENDA ITEMS AND EDUCATIONAL ACTIVITIES AND CONCERNS IN INDIVIDUAL DISTRICTS

Mrs. Cargill gave board members an opportunity to provide information regarding agenda items or other relevant information about public education.

The meeting adjourned at 12:55 p.m.

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Mary Helen Berlanga, Secretary

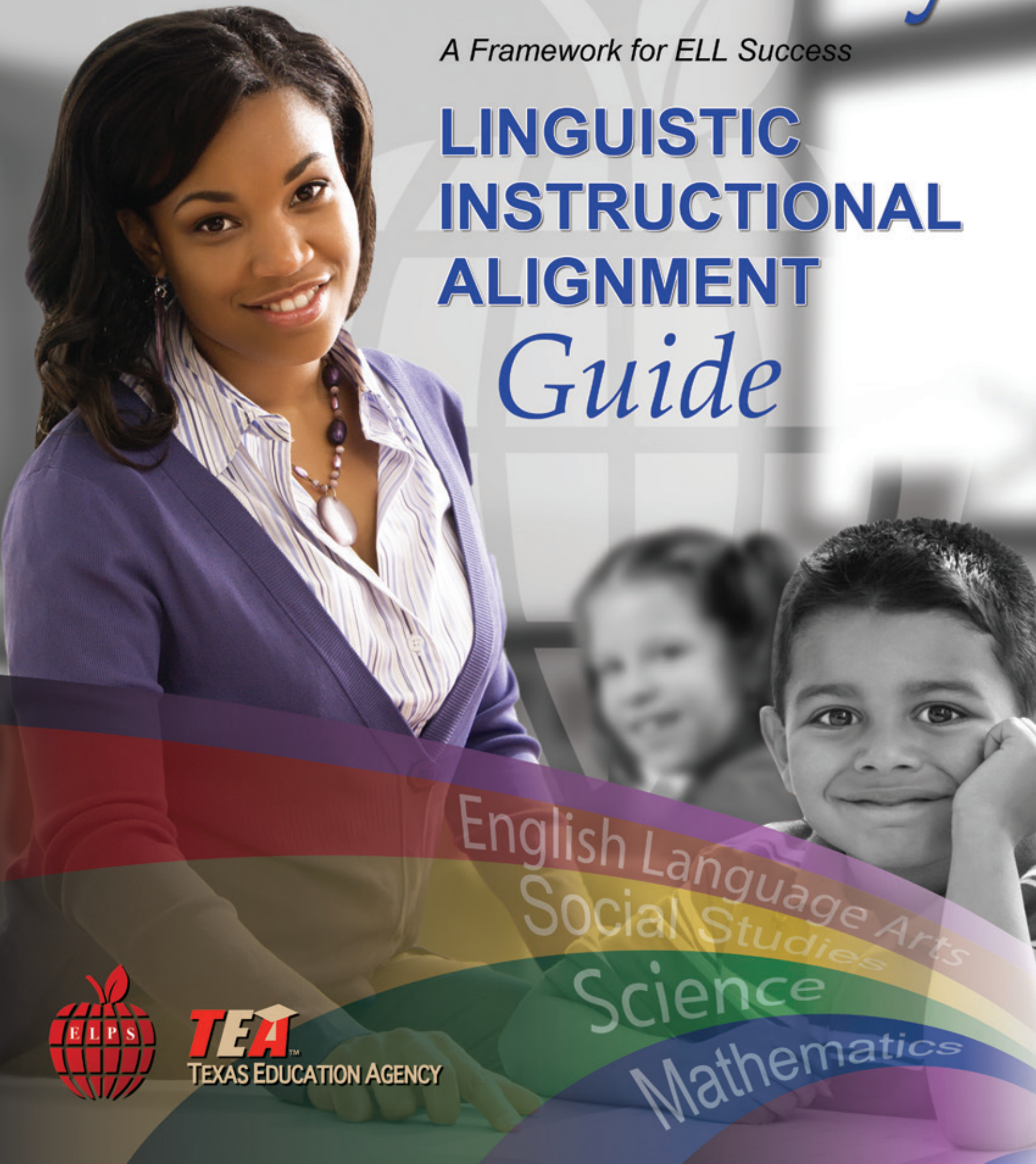
Attachment 4j

Linguistic Instructional Alignment Guide

ELPS Academy

A Framework for ELL Success

LINGUISTIC INSTRUCTIONAL ALIGNMENT *Guide*



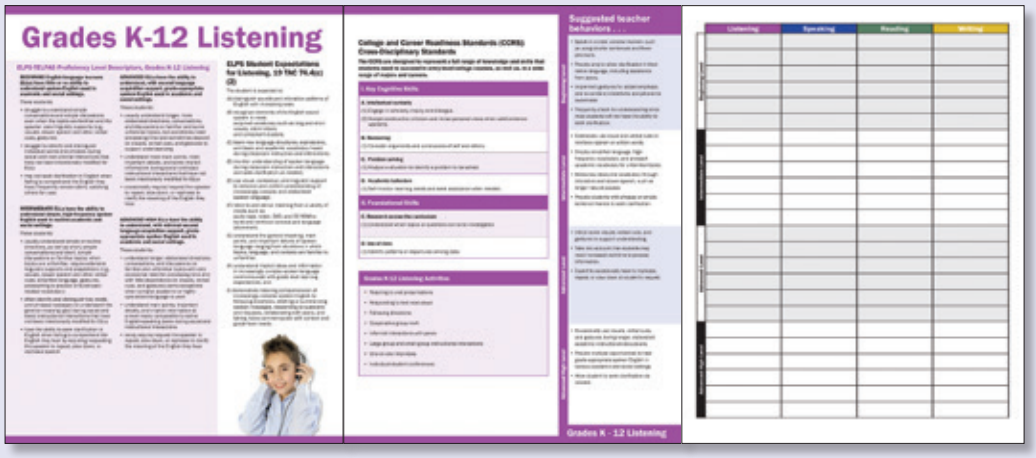
ELPS

TEA™
TEXAS EDUCATION AGENCY

ELPS Linguistic Instructional Alignment Guide

The **ELPS Linguistic Instructional Alignment Guide** allows teachers to see the connections between the ELPS, College and Career Readiness Standards (CCRS), TELPAS Proficiency Level Descriptors, and linguistic accommodations. The integration of these components is critical in lesson planning in order to meet the linguistic needs of English language learners.

- **Listening K-12**
- **Speaking K-12**
- **Reading K-1**
- **Reading 2-12**
- **Writing K-1**
- **Writing 2-12**



This guide will assist you in identifying additional support needed for English language learners in your lesson design and delivery. By listing students' names according to their individual language ratings, you can align your students' proficiency levels with suggested accommodations.

Performance-Based Activities

The following performance-based listening, speaking, reading, and writing activities are recommended for teachers to implement in their instruction as ways to gather information on how students are progressing in English language development. The suggested list of activities is not intended to be exhaustive.

Grades K-12 Listening Activities

- Reacting to oral presentations
- Responding to text read aloud
- Following directions
- Cooperative group work
- Informal interactions with peers
- Large-group and small-group instructional interactions
- One-on-one interviews
- Individual student conferences

Grades K-12 Speaking Activities

- Cooperative group work
- Oral presentations
- Informal interactions with peers
- Large-group and small-group instructional interactions
- One-on-one interviews
- Classroom discussions
- Articulation of problem-solving strategies
- Individual student conferences

Grades K-12 Reading Activities

- Paired reading
- Sing-alongs and read-alongs, including chants and poems
- Shared reading with big books, charts, overhead transparencies, and other displays
- Guided reading with leveled readers
- Reading subject-area texts and related materials
- Independent reading
- Cooperative group work
- Reading-response journals
- Read and think aloud, using high-interest books relating to student's background

Grades K-12 Writing Activities

- Shared writing for literacy and content area development
- Language experience dictation
- Organization of thoughts and ideas through prewriting strategies
- Making lists for specific purposes
- Labeling pictures, objects, and items from projects
- Descriptive writing on a familiar topic or writing about a familiar process
- Narrative writing about a past event
- Reflective writing, such as journaling
- Extended writing from language arts classes
- Expository or procedural writing from science, mathematics, and social studies classes

Excerpted from the TEA Educator Guide to TELPAS

Grades K-12 Listening

ELPS-TELPAS Proficiency Level Descriptors, Grades K-12 Listening

Beginning English language learners (ELLs) have little or no ability to understand spoken English used in academic and social settings.

These students:

- struggle to understand simple conversations and simple discussions even when the topics are familiar and the speaker uses linguistic supports (e.g., visuals, slower speech and other verbal cues, gestures)
- struggle to identify and distinguish individual words and phrases during social and instructional interactions that have not been intentionally modified for ELLs
- may not seek clarification in English when failing to comprehend the English they hear; frequently remain silent, watching others for cues

Intermediate ELLs have the ability to understand simple, high-frequency spoken English used in routine academic and social settings.

These students:

- usually understand simple or routine directions, as well as short, simple conversations and short, simple discussions on familiar topics; when topics are unfamiliar, require extensive linguistic supports and adaptations (e.g., visuals, slower speech and other verbal cues, simplified language, gestures, preteaching to preview or build topic-related vocabulary)
- often identify and distinguish key words and phrases necessary to understand the general meaning (gist) during social and basic instructional interactions that have not been intentionally modified for ELLs
- have the ability to seek clarification in English when failing to comprehend the English they hear by requiring/requesting the speaker to repeat, slow down, or rephrase speech

Advanced ELLs have the ability to understand, with second language acquisition support, grade-appropriate spoken English used in academic and social settings.

These students:

- usually understand longer, more elaborated directions, conversations, and discussions on familiar and some unfamiliar topics, but sometimes need processing time and sometimes depend on visuals, verbal cues, and gestures to support understanding
- understand most main points, most important details, and some implicit information during social and basic instructional interactions that have not been intentionally modified for ELLs
- occasionally require/request the speaker to repeat, slow down, or rephrase to clarify the meaning of the English they hear

Advanced high ELLs have the ability to understand, with minimal second language acquisition support, grade-appropriate spoken English used in academic and social settings.

These students:

- understand longer, elaborated directions, conversations, and discussions on familiar and unfamiliar topics with only occasional need for processing time and with little dependence on visuals, verbal cues, and gestures; some exceptions when complex academic or highly specialized language is used
- understand main points, important details, and implicit information at a level nearly comparable to native English-speaking peers during social and instructional interactions
- rarely require/request the speaker to repeat, slow down, or rephrase to clarify the meaning of the English they hear

ELPS Student Expectations for Listening K–12, 19 TAC 74.4(c)(2)

The student is expected to:

(A) distinguish sounds and intonation patterns of English with increasing ease;

(B) recognize elements of the English sound system in newly acquired vocabulary such as long and short vowels, silent letters, and consonant clusters;

(C) learn new language structures, expressions, and basic and academic vocabulary heard during classroom instruction and interactions;

(D) monitor understanding of spoken language during classroom instruction and interactions and seek clarification as needed;

(E) use visual, contextual, and linguistic support to enhance and confirm understanding of increasingly complex and elaborated spoken language;

(F) listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment;

(G) understand the general meaning, main points, and important details of spoken language ranging from situations in which topics, language, and contexts are familiar to unfamiliar;

(H) understand implicit ideas and information in increasingly complex spoken language commensurate with grade-level learning expectations; and

(I) demonstrate listening comprehension of increasingly complex spoken English by following directions, retelling or summarizing spoken messages, responding to questions and requests, collaborating with peers, and taking notes commensurate with content and grade-level needs.

College and Career Readiness Standards (CCRS): Cross-Disciplinary Standards

The CCRS are designed to represent a full range of knowledge and skills that students need to succeed in entry-level college courses, as well as, in a wide range of majors and careers.

I. Key Cognitive Skills

A. Intellectual curiosity

(1) Engage in scholarly inquiry and dialogue.

(2) Accept constructive criticism and revise personal views when valid evidence warrants.

B. Reasoning

(1) Consider arguments and conclusions of self and others.

C. Problem solving

(1) Analyze a situation to identify a problem to be solved.

D. Academic behaviors

(1) Self-monitor learning needs and seek assistance when needed.

II. Foundational Skills

C. Research across the curriculum

(1) Understand which topics or questions are to be investigated.

D. Use of data

(1) Identify patterns or departures among data.

Grades K-12 Listening Activities

- Reacting to oral presentations
- Responding to text read aloud
- Following directions
- Cooperative group work
- Informal interactions with peers
- Large-group and small-group instructional interactions
- One-on-one interviews
- Individual student conferences

Suggested teacher behaviors . . .

Beginning Level

- Speak in a clear, concise manner, such as using shorter sentences and fewer pronouns.
- Provide and/or allow clarification in his/her native language, including assistance from peers.
- Implement gestures for added emphasis and to combine kinesthetic and phonemic awareness.
- Frequently check for understanding since student will not have the ability to seek clarification.

Intermediate Level

- Extensively use visual and verbal cues to reinforce spoken or written words.
- Employ simplified language, high-frequency vocabulary, and preteach academic vocabulary for unfamiliar topics.
- Stress key ideas and vocabulary through intonation and slower speech, such as longer natural pauses.
- Provide student with phrases or simple sentence frames to seek clarification.

Advanced Level

- Utilize some visuals, verbal cues, and gestures to support understanding.
- Take into account that student may need increased wait time to process information.
- Expect to occasionally have to rephrase, repeat, or slow down at student's request.

Advanced High Level

- Occasionally use visuals, verbal cues, and gestures during longer, elaborated academic instructional discussions.
- Provide multiple opportunities to hear grade-appropriate spoken English in various academic and social settings.
- Allow student to seek clarification as needed.

Grades K-12 Speaking

ELPS-TELPAS Proficiency Level Descriptors, Grades K-12 Speaking

Beginning English language learners (ELLs) have little or no ability to speak English in academic and social settings.

These students:

- mainly speak using single words and short phrases consisting of recently practiced, memorized, or highly familiar material to get immediate needs met; may be hesitant to speak and often give up in their attempts to communicate
- speak using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts
- lack the knowledge of English grammar necessary to connect ideas and speak in sentences; can sometimes produce sentences using recently practiced, memorized, or highly familiar material
- exhibit second language acquisition errors that may hinder overall communication, particularly when trying to convey information beyond memorized, practiced, or highly familiar material
- typically use pronunciation that significantly inhibits communication

Intermediate ELLs have the ability to speak in a simple manner using English commonly heard in routine academic and social settings.

These students:

- are able to express simple, original messages, speak using sentences, and participate in short conversations and classroom interactions; may hesitate frequently and for long periods to think about how to communicate desired meaning
- speak simply using basic vocabulary needed in everyday social interactions and routine academic contexts; rarely have vocabulary to speak in detail
- exhibit an emerging awareness of English grammar and speak using mostly simple sentence structures and simple tenses; are most comfortable speaking in present tense
- exhibit second language acquisition errors that may hinder overall communication when trying to use complex or less familiar English
- use pronunciation that can usually be understood by people accustomed to interacting with ELLs

Advanced ELLs have the ability to speak using grade-appropriate English, with second languauge acquisition support, in academic and social settings.

These students:

- are able to participate comfortably in most conversations and academic discussions on familiar topics, with some pauses to restate, repeat, or search for words and phrases to clarify meaning
- discuss familiar academic topics using content-based terms and common abstract vocabulary; can usually speak in some detail on familiar topics
- have a grasp of basic grammar features, including a basic ability to narrate and describe in present, past, and future tenses; have an emerging ability to use complex sentences and complex grammar features
- make errors that interfere somewhat with communication when using complex grammar structures, long sentences, and less familiar words and expressions
- may mispronounce words, but use pronunciation that can usually be understood by people not accustomed to interacting with ELLs

Advanced high ELLs have the ability to speak using grade-appropriate English, with minimal second language acquisition support, in academic and social settings.

These students:

- are able to participate in extended discussions on a variety of social and grade-appropriate academic topics with only occasional disruptions, hesitations, or pauses
- communicate effectively using abstract and content-based vocabulary during classroom instructional tasks, with some exceptions when low-frequency or academically demanding vocabulary is needed; use many of the same idioms and colloquialisms as their native English-speaking peers
- can use English grammar structures and complex sentences to narrate and describe at a level nearly comparable to native English-speaking peers
- make few second language acquisition errors that interfere with overall communication
- may mispronounce words, but rarely use pronunciation that interferes with overall communication

ELPS Student Expectations for Speaking K–12, 19 TAC 74.4(c)(3)

The student is expected to:

(A) practice producing sounds of newly acquired vocabulary such as long and short vowels, silent letters, and consonant clusters to pronounce English words in a manner that is increasingly comprehensible;

(B) expand and internalize initial English vocabulary by learning and using high-frequency English words necessary for identifying and describing people, places, and objects, by retelling simple stories and basic information represented or supported by pictures, and by learning and using routine language needed for classroom communication;

(C) speak using a variety of grammatical structures, sentence lengths, sentence types, and connecting words with increasing accuracy and ease as more English is acquired;

(D) speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency;

(E) share information in cooperative learning interactions;

(F) ask and give information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments;

(G) express opinions, ideas, and feelings ranging from communicating single words and short phrases to participating in extended discussions on a variety of social and grade-appropriate academic topics;

(H) narrate, describe, and explain with increasing specificity and detail as more English is acquired;

(I) adapt spoken language appropriately for formal and informal purposes; and

(J) respond orally to information presented in a wide variety of print, electronic, audio, and visual media to build and reinforce concept and language attainment.

College and Career Readiness Standards (CCRS): Cross-Disciplinary Standards

The CCRS are designed to represent a full range of knowledge and skills that students need to succeed in entry-level college courses, as well as, in a wide range of majors and careers.

I. Key Cognitive Skills

A. Intellectual curiosity

(1) Engage in scholarly inquiry and dialogue.

(2) Accept constructive criticism and revise personal views when valid evidence warrants.

B. Reasoning

(2) Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions.

D. Academic behaviors

(1) Self-monitor learning needs and seek assistance when needed.

F. Academic integrity

(1) Include the ideas of others and the complexities of the debate, issue, or problem.

II. Foundational Skills

C. Research across the curriculum

(8) Present final product.

D. Use of data

(3) Present analyzed data and communicate findings in a variety of formats.

E. Technology

(3) Use technology to communicate and display findings in a clear and coherent manner.

Grades K-12 Speaking Activities

- Cooperative group work
- Oral presentations
- Informal interactions with peers
- Large-group and small-group instructional interactions
- One-on-one interviews
- Classroom discussions
- Articulation of problem-solving strategies
- Individual student conferences

Suggested teacher behaviors . . .

Beginning Level

- Respect student's silent period and do not force him/her to speak if the student is hesitant to participate.
- Accept responses consisting of single words and phrases from highly familiar or memorized vocabulary.
- Frequently model intonation and correct pronunciation in a variety of social and academic contexts.
- Expect pronunciation errors that may inhibit communication.

Intermediate Level

- Allow sufficient wait time so student can process and communicate his/her responses.
- Provide simple sentence frames, answer choices, or graphic organizers for student to use in his/her responses.
- Focus on the content of student's response and not on pronunciation or grammatical errors.
- Realize that student may speak mostly in simple, present tense sentences and rarely with any details.

Advanced Level

- Assign oral presentations to practice using content-based terms and common abstract vocabulary.
- Use graphic organizers to develop student's ability to use present, past, and future tenses and provide details while speaking.
- Have student participate in cooperative group work to support peer interactions.

Advanced High Level

- Ask student to narrate and describe problem-solving strategies using complex sentences.
- Introduce, model, practice, and review the use of idioms and colloquialisms in a variety of social and academic contexts.
- Encourage student to participate in a variety of extended social and academic discussions.

Grades K-1 Reading

ELPS-TELPAS Proficiency Level Descriptors, Grades K-1 Reading

Beginning English language learners (ELLs) have little or no ability to use the English language to build foundational reading skills.

These students:

- derive little or no meaning from grade-appropriate stories read aloud in English, unless the stories are
  - read in short "chunks"
  - controlled to include the little English they know such as language that is high-frequency, concrete, and recently practiced
  - accompanied by ample visual supports such as illustrations, gestures, pantomime, and objects and by linguistic supports such as careful enunciation and slower speech
- begin to recognize and understand environmental print in English (e.g., signs, labeled items, names of peers, logos)
- have difficulty decoding most grade-appropriate English text because they *
  - understand the meaning of very few words in English
  - struggle significantly with sounds in spoken English words and with sound-symbol relationships due to differences between their primary language and English

Intermediate ELLs have a limited ability to use the English language to build foundational reading skills.

These students:

- demonstrate limited comprehension (key words and general meaning) of grade-appropriate stories read aloud in English, unless the stories include
  - predictable story lines
  - highly familiar topics
  - primarily high-frequency, concrete vocabulary
  - short, simple sentences
  - visual and linguistic supports
- regularly recognize and understand common environmental print in English (e.g., signs, labeled items, names of peers, logos)
- have difficulty decoding grade-appropriate English text because they*
  - understand the meaning of only those English words they hear frequently
  - struggle with some sounds in English words and some sound-symbol relationships due to differences between their primary language and English

Advanced ELLs have the ability to use the English language, with second language acquisition support, to build foundational reading skills.

These students:

- demonstrate comprehension of most main points and most supporting ideas in grade-appropriate stories read aloud in English, although they may still depend on visual and linguistic supports to gain or confirm meaning
- recognize some basic English vocabulary and high-frequency words in isolated print
- with second language acquisition support, are able to decode most grade-appropriate English text because they *
  - understand the meaning of most grade-appropriate English words
  - have little difficulty with English sounds and sound-symbol relationships that result from differences between their primary language and English

Advanced high ELLs have the ability to use the English language, with minimal second language acquisition support, to build foundational reading skills.

These students:

- demonstrate, with minimal second language acquisition support and at a level nearly comparable to native English-speaking peers, comprehension of main points and supporting ideas (explicit and implicit) in grade-appropriate stories read aloud in English
- with some exceptions, recognize sight vocabulary and high-frequency words to a degree nearly comparable to that of native English-speaking peers
- with minimal second language acquisition support, have an ability to decode and understand grade-appropriate English text at a level nearly comparable to native English-speaking peers *

* The last descriptor applies only to students who are at the developmental stage of decoding written text (i.e., they have "cracked the code" necessary for learning to read).

ELPS Student Expectations for Reading K–1, 19 TAC 74.4(c)(4)

The student is expected to:

(A) learn relationships between sounds and letters of the English language and decode (sound out) words using a combination of skills such as recognizing sound-letter relationships and identifying cognates, affixes, roots, and base words;

(B) recognize directionality of English reading such as left to right and top to bottom;

(C) develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials;

(D) use prereading supports such as graphic organizers, illustrations, and pretaught topic-related vocabulary and other prereading activities to enhance comprehension of written text;

(E) read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned;

(F) use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary, grasp of language structures, and background knowledge needed to comprehend increasingly challenging language;

(G) demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs;

(H) read silently with increasing ease and comprehension for longer periods;

(I) demonstrate English comprehension and expand reading skills by employing basic reading skills such as demonstrating understanding of supporting ideas and details in text and graphic sources, summarizing text, and distinguishing main ideas from details commensurate with content area needs;

(J) demonstrate English comprehension and expand reading skills by employing inferential skills such as predicting, making connections between ideas, drawing inferences and conclusions from text and graphic sources, and finding supporting text evidence commensurate with content area needs; and

(K) demonstrate English comprehension and expand reading skills by employing analytical skills such as evaluating written information and performing critical analyses commensurate with content area and grade-level needs.

College and Career Readiness Standards (CCRS): Cross-Disciplinary Standards

The CCRS are designed to represent a full range of knowledge and skills that students need to succeed in entry-level college courses, as well as, in a wide range of majors and careers.

I. Key Cognitive Skills

B. Reasoning

(1) Consider arguments and conclusions of self and others.
(3) Gather evidence to support arguments, findings, or lines of reasoning.
(4) Support or modify claims based on the results of an inquiry.

D. Academic behaviors

(1) Self-monitor learning needs and seek assistance when needed.

F. Academic integrity

(2) Evaluate sources for quality of content, validity, credibility, and relevance.

II. Foundational Skills

A. Reading across the curriculum

(1) Use effective prereading strategies.
(2) Use a variety of strategies to understand the meanings of new words.
(3) Identify the intended purpose and audience of the text.
(4) Identify the key information and supporting details.
(5) Analyze textual information critically.
(6) Annotate, summarize, paraphrase, and outline texts when appropriate.
(7) Adapt reading strategies according to structure of texts.
(8) Connect reading to historical and current events and personal interest.

D. Use of data

(1) Identify patterns or departures from patterns among data.
(2) Use statistical and probabilistic skills necessary for planning an investigation and collecting, analyzing, and interpreting data.

E. Technology

(1) Use technology to gather information.
(2) Use technology to organize, manage, and analyze information.

Grades K-1 Reading Activities

- Paired reading
- Sing-alongs and read-alongs, including chants and poems
- Shared reading with big books, charts, overhead transparencies, and other displays
- Guided reading with leveled readers
- Reading subject-area texts and related materials
- Independent reading
- Cooperative group work
- Reading-response journals

Suggested teacher behaviors . . .

Beginning Level

- Provide multiple opportunities for shared reading, read-alongs and sing-alongs, including chants and poems.
- Use big books and charts with extensive visuals such as illustrations, gestures, pantomime and objects.
- Read stories in chunks, adjust enunciation, and use slower speech to stress sound-symbol relationships.
- Display many examples of environmental print such as alphabet cards, signs, and labeling.

Intermediate Level

- Read predictable patterned books that may include rhyming words and repetition of key words.
- Display environmental print including word walls, labeled pictures/items, and logos.
- Allow student to retell stories orally, using pictures, or in short, simple sentences and/or phrases in journals.
- Expect first language interference with some sound-symbol relationships in English.

Advanced Level

- Read and think aloud to focus on main points and details to provide visual and linguistic support.
- Vary cooperative groups including partners, small groups, and whole class for shared reading.
- Utilize guided reading with leveled readers to check student's comprehension, recognition of basic vocabulary, and difficulty with sound-symbol relationships.

Advanced High Level

- Read and think aloud using subject-area texts and related materials.
- Check for student's comprehension of explicit and implicit ideas in stories read aloud in English.
- Assign independent reading of grade-appropriate English text.

Grades 2-12 Reading

ELPS-TELPAS Proficiency Level Descriptors, Grades 2-12 Reading

Beginning English language learners (ELLs) have little or no ability to read and understand English used in academic and social contexts.

These students:

- read and understand the very limited recently practiced, memorized, or highly familiar English they have learned; vocabulary predominantly includes
  - environmental print
  - some very high-frequency words
  - concrete words that can be represented by pictures
- read slowly, word by word
- have a very limited sense of English language structures
- comprehend predominantly isolated familiar words and phrases; comprehend some sentences in highly routine contexts or recently practiced, highly familiar text
- are highly dependent on visuals and prior knowledge to derive meaning from text in English
- are able to apply reading comprehension skills in English only when reading texts written for this level

Intermediate ELLs have the ability to read and understand simple, high-frequency English used in routine academic and social contexts.

These students:

- read and understand English vocabulary on a somewhat wider range of topics and with increased depth; vocabulary predominantly includes
  - everyday oral language
  - literal meanings of common words
  - routine academic language and terms
  - commonly used abstract language such as terms used to describe basic feelings
- often read slowly and in short phrases; may re-read to clarify meaning
- have a growing understanding of basic, routinely used English language structures
- understand simple sentences in short, connected texts, but are dependent on visual cues, topic familiarity, prior knowledge, pretaught topic-related vocabulary, story predictability, and teacher/peer assistance to sustain comprehension
- struggle to independently read and understand grade-level texts
- are able to apply basic and some higher-order comprehension skills when reading texts that are linguistically accommodated and/or simplified for this level

Advanced ELLs have the ability to read and understand, with second language acquisition support, grade-appropriate English used in academic and social contexts.

These students:

- read and understand, with second language acquisition support, a variety of grade-appropriate English vocabulary used in social and academic contexts:
  - with second language acquisition support, read and understand grade-appropriate concrete and abstract vocabulary, but have difficulty with less commonly encountered words
  - demonstrate an emerging ability to understand words and phrases beyond their literal meaning
  - understand multiple meanings of commonly used words
- read longer phrases and simple sentences from familiar text with appropriate rate and speed
- are developing skill in using their growing familiarity with English language structures to construct meaning of grade-appropriate text
- are able to apply basic and higher-order comprehension skills when reading grade-appropriate text, but are still occasionally dependent on visuals, teacher/peer assistance, and other linguistically accommodated text features to determine or clarify meaning, particularly with unfamiliar topics

Advanced high ELLs have the ability to read and understand, with minimal second language acquisition support, grade appropriate English used in academic and social contexts.

These students:

- read and understand vocabulary at a level nearly comparable to that of their native English-speaking peers, with some exceptions when low-frequency or specialized vocabulary is used
- generally read grade-appropriate, familiar text with appropriate rate, speed, intonation, and expression
- are able to, at a level nearly comparable to native English-speaking peers, use their familiarity with English language structures to construct meaning of grade-appropriate text
- are able to apply, with minimal second language acquisition support and at a level nearly comparable to native English-speaking peers, basic and higher-order comprehension skills when reading grade-appropriate text

ELPS Student Expectations for Reading 2–12, 19 TAC 74.4(c)(4)

The student is expected to:

(A) learn relationships between sounds and letters of the English language and decode (sound out) words using a combination of skills such as recognizing sound-letter relationships and identifying cognates, affixes, roots, and base words;

(B) recognize directionality of English reading such as left to right and top to bottom;

(C) develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials;

(D) use prereading supports such as graphic organizers, illustrations, and pretaught topic-related vocabulary and other prereading activities to enhance comprehension of written text;

(E) read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned;

(F) use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary, grasp of language structures, and background knowledge needed to comprehend increasingly challenging language;

(G) demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs;

(H) read silently with increasing ease and comprehension for longer periods;

(I) demonstrate English comprehension and expand reading skills by employing basic reading skills such as demonstrating understanding of supporting ideas and details in text and graphic sources, summarizing text, and distinguishing main ideas from details commensurate with content area needs;

(J) demonstrate English comprehension and expand reading skills by employing inferential skills such as predicting, making connections between ideas, drawing inferences and conclusions from text and graphic sources, and finding supporting text evidence commensurate with content area needs; and

(K) demonstrate English comprehension and expand reading skills by employing analytical skills such as evaluating written information and performing critical analyses commensurate with content area and grade-level needs.

College and Career Readiness Standards (CCRS): Cross-Disciplinary Standards

The CCRS are designed to represent a full range of knowledge and skills that students need to succeed in entry-level college courses, as well as, in a wide range of majors and careers.

I. Key Cognitive Skills

B. Reasoning

(1) Consider arguments and conclusions of self and others.
(3) Gather evidence to support arguments, findings, or lines of reasoning.
(4) Support or modify claims based on the results of an inquiry.

D. Academic behaviors

(1) Self-monitor learning needs and seek assistance when needed.

F. Academic integrity

(2) Evaluate sources for quality of content, validity, credibility, and relevance.

II. Foundational Skills

A. Reading across the curriculum

(1) Use effective prereading strategies.
(2) Use a variety of strategies to understand the meanings of new words.
(3) Identify the intended purpose and audience of the text.
(4) Identify the key information and supporting details.
(5) Analyze textual information critically.
(6) Annotate, summarize, paraphrase, and outline texts when appropriate.
(7) Adapt reading strategies according to structure of texts.
(8) Connect reading to historical and current events and personal interest.

D. Use of data

(1) Identify patterns or departures from patterns among data.
(2) Use statistical and probabilistic skills necessary for planning an investigation and collecting, analyzing, and interpreting data.

E. Technology

(1) Use technology to gather information.
(2) Use technology to organize, manage, and analyze information.

Grades 2-12 Reading Activities

- Paired reading
- Read and think aloud, using high-interest books relating to student's background
- Shared reading with books, charts, overhead transparencies, and other displays
- Guided reading with leveled readers
- Reading subject-area texts and related materials
- Independent reading
- Cooperative group work
- Reading-response journals

Suggested teacher behaviors . . .

Beginning Level

- Display multiple examples of environmental print including but not limited to labels, signs, and logos.
- Respect that student may not feel comfortable reading aloud since they may read slowly, word by word.
- Read aloud to model enunciation and the use of English language structures.
- Use simplified, decodable texts with visuals and highly- familiar English they have learned.

Intermediate Level

- Allow student to read independently providing him/her with additional time to read slowly and reread for clarification.
- Use high-interest texts that use common vocabulary used routinely in everyday oral and academic language.
- Increase student's comprehension of text with visuals, peer support, pretaught topic-related vocabulary and predictable stories.

Advanced Level

- Read and think aloud to focus on main points, details, context clues, and abstract vocabulary.
- Preteach low-frequency and multiple-meaning vocabulary used in social and academic contexts.
- Use varied cooperative groups to encourage and provide student with oral reading opportunities.

Advanced High Level

- Use grade-appropriate texts that will promote vocabulary development of low-frequency or specialized, content-specific words.
- Assign research projects that are grade and/or content specific.
- Have student read texts that require higher-order comprehension skills such as understanding expository text, drawing conclusions and constructing meaning of unfamiliar concepts.

Grades K-1 Writing

ELPS-TELPAS Proficiency Level Descriptors, Grades K-1 Writing

Beginning English language learners (ELLs) have little or no ability to read and understand English used in academic and social contexts.

These students:

- are unable to use English to explain self-generated writing (e.g., stories they have created or other personal expressions), including emergent forms of writing (pictures, letter-like forms, mock words, scribbling, etc.)
- know too little English to participate meaningfully in grade-appropriate shared writing activities using the English language
- cannot express themselves meaningfully in self-generated, connected written text in English beyond the level of high-frequency, concrete words, phrases, or short sentences that have been recently practiced/memorized *
- may demonstrate little or no awareness of English print conventions

Intermediate ELLs have a limited ability to use the English language to build foundational writing skills.

These students:

- know enough English to explain briefly and simply self-generated writing, including emergent forms of writing, as long as the topic is highly familiar and concrete and requires very high-frequency English
- can participate meaningfully in grade-appropriate shared writing activities using the English language only when the writing topic is highly familiar and concrete and requires very high-frequency English
- know enough English to explain briefly and simply self-generated writing, including emergent forms of writing, as long as the topic is highly familiar and concrete and requires very high-frequency English
- can participate meaningfully in grade-appropriate shared writing activities using the English language only when the writing topic is highly familiar and concrete and requires very high-frequency English

Advanced ELLs have the ability to use the English language to build, with second language acquisition support, foundational writing skills.

These students:

- use predominantly grade-appropriate English to explain, in some detail, most self-generated writing, including emergent forms of writing
- can participate meaningfully, with second language acquisition support, in most grade-appropriate shared writing activities using the English language
- although second language acquisition support is needed, have an emerging ability to express themselves in self-generated, connected written text in English in a grade-appropriate manner *
- occasionally exhibit second language acquisition errors when writing in English*

Advanced high ELLs have the ability to use the English language to build, with minimal second language acquisition support, foundational writing skills.

These students:

- use English at a level of complexity and detail nearly comparable to that of native English-speaking peers when explaining self-generated writing, including emergent forms of writing
- can participate meaningfully in most grade-appropriate shared writing activities using the English language
- although minimal second language acquisition support may be needed, express themselves in self-generated, connected written text in English in a manner nearly comparable to their native English-speaking peers *

ELPS Student Expectations for Writing K–1, 19 TAC 74.4(c)(5)

The student is expected to:

(A) learn relationships between sounds and letters of the English language to represent sounds when writing in English;

(B) write using newly acquired basic vocabulary and content-based grade-level vocabulary;

(C) spell familiar English words with increasing accuracy, and employ English spelling patterns and rules with increasing accuracy as more English is acquired;

(D) edit writing for standard grammar and usage, including subject-verb agreement, pronoun agreement, and appropriate verb tenses commensurate with grade-level expectations as more English is acquired;

(E) employ increasingly complex grammatical structures in content area writing commensurate with grade-level expectations, such as:

(i) using correct verbs, tenses, and pronouns/antecedents;

(ii) using possessive case (apostrophe *s*) correctly; and

(iii) using negatives and contractions correctly.

(F) write using a variety of grade-appropriate sentence lengths, patterns, and connecting words to combine phrases, clauses, and sentences in increasingly accurate ways as more English is acquired; and

(G) narrate, describe, and explain with increasing specificity and detail to fulfill content area writing needs as more English is acquired.

* These descriptors apply only to students who are at the developmental stage of generating original written text using a standard writing system.

College and Career Readiness Standards (CCRS): Cross-Disciplinary Standards

The CCRS are designed to represent a full range of knowledge and skills that students need to succeed in entry-level college courses, as well as in a wide range of majors and careers.

I. Key Cognitive Skills

A. Intellectual curiosity

(2) Accept constructive criticism and revise personal views when valid evidence warrants.

B. Reasoning

(2) Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions.

(3) Gather evidence to support arguments, findings, or lines of reasoning.

(4) Support or modify claims based on the results of an inquiry.

F. Academic integrity

(1) Attribute ideas and information to source materials and people.

(3) Include the ideas of others and the complexities of the debate, issue, or problem.

II. Foundational Skills

B. Writing across the curriculum

(1) Writing clearly and coherently using standard writing conventions.

(2) Write in a variety of forms for various audiences and purposes.

(3) Compose and revise drafts.

D. Use of data

(3) Present analyzed data and communicate findings in a variety of formats.

E. Technology

(1) Use technology to gather information.

(2) Use technology to organize, manage, and analyze information.

(3) Use technology to communicate and display findings in clear and coherent manner.

(4) Use technology appropriately.

Grades K-1 Writing Activities

- Journal writing for personal reflections
- Shared writing for literacy and content area development
- Language experience dictation
- Organization of thoughts and ideas through prewriting strategies
- Publishing and presenting
- Making lists for specific purposes
- Labeling pictures, objects, and items from projects
- Cooperative group work
- First drafts

Suggested teacher behaviors . . .

Beginning Level

- Implement many shared writing activities to develop student's awareness of English print conventions.
- Point to read each word when reading stories aloud and select letters and words to write on board or chart.
- Provide labeled pictures and illustrations to develop basic and content-area, concrete vocabulary.
- Allow student to use pictures, letter-like forms, mock words, scribbling or to dictate his/her personal reflections.

Intermediate Level

- Present, publish, and display whole-class writing projects as examples of print conventions of high-frequency, concrete words and simple sentences.
- Ask student to briefly explain his/her self-generated emergent writing.
- Expect first language interference such as primary language words, spelling patterns, word order and literal translating in personal reflections.

Advanced Level

- Read and think aloud to focus on main points and details using grade-appropriate English.
- Have student participate in shared writing activities by asking him/her to write on board or copy in journal.
- Use concept mapping with whole class for vocabulary development and making personal connections to texts.

Advanced High Level

- Have student orally present and explain his/her written work.
- Provide sentence strips so student can write sentences and cut them up to manipulate word order or concept.
- Use graphic organizers to introduce and practice writing first drafts.
- Assign independent writing in personal reflection journals on whole class or cooperative group tasks.

Grades 2-12 Writing

ELPS-TELPAS Proficiency Level Descriptors, Grades 2-12 Writing

Beginning English language learners (ELLs) lack the English vocabulary and grasp of English language structures necessary to address grade-appropriate writing tasks meaningfully.

These students:

- have little or no ability to use the English language to express ideas in writing and engage meaningfully in grade-appropriate writing assignments in content area instruction
- lack the English necessary to develop or demonstrate elements of grade-appropriate writing (e.g., focus and coherence, conventions, organization, voice, and development of ideas) in English

Typical writing features at this level:

- ability to label, list, and copy
- high-frequency words/phrases and short, simple sentences (or even short paragraphs) based primarily on recently practiced, memorized, or highly familiar material; this type of writing may be quite accurate
- present tense used primarily
- frequent primary language features (spelling patterns, word order, literal translations, and words from the student's primary language) and other errors associated with second language acquisition may significantly hinder or prevent understanding, even for individuals accustomed to the writing of ELLs

Intermediate ELLs have enough English vocabulary and enough grasp of English language structures to address grade-appropriate writing tasks in a limited way.

These students:

- have a limited ability to use the English language to express ideas in writing and engage meaningfully in grade-appropriate writing assignments in content area instruction
- are limited in their ability to develop or demonstrate elements of grade-appropriate writing in English; communicate best when topics are highly familiar and concrete, and require simple, high-frequency English

Typical writing features at this level:

- simple, original messages consisting of short, simple sentences; frequent inaccuracies occur when creating or taking risks beyond familiar English
- high-frequency vocabulary; academic writing often has an oral tone
- loosely connected text with limited use of cohesive devices or repetitive use, which may cause gaps in meaning
- repetition of ideas due to lack of vocabulary and language structures
- present tense used most accurately; simple future and past tenses, if attempted, are used inconsistently or with frequent inaccuracies
- descriptions, explanations, and narrations lacking detail; difficulty expressing abstract ideas
- primary language features and errors associated with second language acquisition may be frequent
- some writing may be understood only by individuals accustomed to the writing of ELLs; parts of the writing may be hard to understand even for individuals accustomed to the writing of ELLs

Advanced ELLs have enough English vocabulary and command of English language structures to address grade-appropriate writing tasks, although second language acquisition support is needed.

These students:

- are able to use the English language, with second language acquisition support, to express ideas in writing and engage meaningfully in grade-appropriate writing assignments in content area instruction
- know enough English to be able to develop or demonstrate elements of grade-appropriate writing in English, although second language acquisition support is particularly needed when topics are abstract, academically challenging, or unfamiliar

Typical writing features at this level:

- grasp of basic verbs, tenses, grammar features, and sentence patterns; partial grasp of more complex verbs, tenses, grammar features, and sentence patterns
- emerging grade-appropriate vocabulary; academic writing has a more academic tone
- use of a variety of common cohesive devices, although some redundancy may occur
- narrations, explanations, and descriptions developed in some detail with emerging clarity; quality or quantity declines when abstract ideas are expressed, academic demands are high, or low-frequency vocabulary is required
- occasional second language acquisition errors
- communications are usually understood by individuals not accustomed to the writing of ELLs

Advanced high ELLs have acquired the English vocabulary and command of English language structures necessary to address grade-appropriate writing tasks with minimal second language acquisition support.

These students:

- are able to use the English language, with minimal second language acquisition support, to express ideas in writing and engage meaningfully in grade-appropriate writing assignments in content area instruction
- know enough English to be able to develop or demonstrate, with minimal second language acquisition support, elements of grade-appropriate writing in English

Typical writing features at this level:

- nearly comparable to writing of native English-speaking peers in clarity and precision with regard to English vocabulary and language structures, with occasional exceptions when writing about academically complex ideas, abstract ideas, or topics requiring low-frequency vocabulary
- occasional difficulty with naturalness of phrasing and expression
- errors associated with second language acquisition are minor and usually limited to low-frequency words and structures; errors rarely interfere with communication

ELPS Student Expectations for Writing 2–12, 19 TAC 74.4(c)(5)

The student is expected to:

(A) learn relationships between sounds and letters of the English language to represent sounds when writing in English;

(B) write using newly acquired basic vocabulary and content-based grade-level vocabulary;

(C) spell familiar English words with increasing accuracy, and employ English spelling patterns and rules with increasing accuracy as more English is acquired;

(D) edit writing for standard grammar and usage, including subject-verb agreement, pronoun agreement, and appropriate verb tenses commensurate with grade-level expectations as more English is acquired;

(E) employ increasingly complex grammatical structures in content area writing commensurate with grade-level expectations, such as:

(i) using correct verbs, tenses, and pronouns/antecedents;

(ii) using possessive case (apostrophe *s*) correctly; and

(iii) using negatives and contractions correctly.

(F) write using a variety of grade-appropriate sentence lengths, patterns, and connecting words to combine phrases, clauses, and sentences in increasingly accurate ways as more English is acquired; and

(G) narrate, describe, and explain with increasing specificity and detail to fulfill content area writing needs as more English is acquired.

College and Career Readiness Standards (CCRS): Cross-Disciplinary Standards

The CCRS are designed to represent a full range of knowledge and skills that students need to succeed in entry-level college courses, as well as in a wide range of majors and careers.

I. Key Cognitive Skills

A. Intellectual curiosity

(2) Accept constructive criticism and revise personal views when valid evidence warrants.

B. Reasoning

(2) Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions.

(3) Gather evidence to support arguments, findings, or lines of reasoning.

(4) Support or modify claims based on the results of an inquiry.

F. Academic integrity

(1) Attribute ideas and information to source materials and people.

(3) Include the ideas of others and the complexities of the debate, issue, or problem.

II. Foundational Skills

B. Writing across the curriculum

(1) Writing clearly and coherently using standard writing conventions.

(2) Write in a variety of forms for various audiences and purposes.

(3) Compose and revise drafts.

D. Use of data

(3) Present analyzed data and communicate findings in a variety of formats.

E. Technology

(1) Use technology to gather information.

(2) Use technology to organize, manage, and analyze information.

(3) Use technology to communicate and display findings in clear and coherent manner.

(4) Use technology appropriately.

Grades 2-12 Writing Activities

- Descriptive writing on a familiar topic
- Writing about a familiar process
- Narrative writing about a past event
- Reflective writing
- Extended writing from language arts classes
- Expository or procedural writing from science, mathematics, and social studies classes

Suggested teacher behaviors . . .

Beginning Level

- Present, publish, and display whole-class writing projects as examples of print conventions of high-frequency, concrete words and simple sentences.
- Utilize various graphic organizers for vocabulary development such as the Frayer model, word wall, and personal vocabulary notebook/journal.
- Implement shared writing activities such as using a visual context and familiar topics to elicit details.
- Use a familiar topic to brainstorm and model organization of thoughts using simple sentences.

Intermediate Level

- Create an interactive word wall that student can use during independent or cooperative writing tasks.
- Have a shared writing activity about a familiar expository or procedural topic to model the use of cohesive devices.
- Assign independent reflective writing having student make personal connections using present and past tense.
- Expect student's writing samples to have first language interference such as literal translation, word order, etc.

Advanced Level

- Use concept mapping to develop student's ability to write more detailed and narrative writing samples.
- Read texts that require student to draw conclusions and understand abstract ideas to describe or explain in his/her writing journals.
- Have student write a personal narrative requiring the use of a graphic organizer to compose a first draft.

Advanced High Level

- Assign research projects that require the gathering of information to support or contradict his/her findings to present and publish.
- Expose student to multiple examples of texts that were written for a variety of purposes and audiences.

Linguistically Accommodated Instruction

The ever-changing diversity of our English language learners (ELLs) and their equally diverse academic needs require educators to routinely provide second language acquisition support through linguistically accommodated instruction. This support facilitates the challenging task that ELLs face learning English and content area material simultaneously.

Linguistically accommodated instruction involves the differentiation of instructional materials, strategies, and tasks based on the student's current level of language proficiency. Classroom instruction and content should be communicated in a manner that ELLs understand through the use of sequential skills and scaffolded instructional techniques and tasks. As students learn English, linguistic accommodations are adjusted to meet the individual ongoing academic language needs.

	Listening	Speaking	Reading	Writing
Beginning Level				
Intermediate Level				
Advanced Level				
Advanced High Level				

Instructional note: Plot students' names according to their individual language proficiency rating in each designated domain.

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