

STATE OF TEXAS ASSESSMENTS OF ACADEMIC READINESS END-OF-YEAR AND BEGINNING-OF-YEAR RESULTS

END-OF-YEAR AND BEGINNING-OF-YEAR ASSESSMENTS ADMINISTRATION

In spring 2020, after the cancellation of the spring and summer State of Texas Assessments of Academic Readiness (STAAR®) tests due to the COVID-19 pandemic, the Texas Education Agency (TEA) offered optional end-of-year (EOY) assessments. At the beginning of the 2020–2021 school year, TEA offered optional beginning-of-year (BOY) assessments. These assessments were designed to be an optional tool schools could use to measure student progress and understanding of the statewide curriculum, the Texas Essential Knowledge and Skills (TEKS). Both the EOY and BOY assessments were constructed from previously released STAAR items.

The EOY and BOY assessments covered the same grades/subjects and courses that are provided for STAAR. They included grades 3–8 mathematics and reading, grades 4 and 7 writing, grades 5 and 8 science, grade 8 social studies, Algebra I, English I, English II, Biology, and U.S. History. Spanish versions of EOY and BOY assessments were also available for grades 3–5 mathematics and reading, grade 4 writing, and grade 5 science. The EOY and BOY assessments were built to the STAAR blueprint, with the exception of the Writing and English assessments. These assessments did not include a writing prompt and were multiple-choice only. EOY and BOY assessments were not offered for Algebra II and English III. Using the item parameters from previous STAAR administrations, pre-equated scoring tables were created to allow for instant reporting of scale scores and performance levels based on the total raw score for each test.

The EOY assessments were made available from May 11, 2020, to June 12, 2020, while the BOY assessments were available from July 27, 2020, until October 16, 2020. Students were able to access the assessments as a printable PDF or online at home using Pearson’s Schoolnet platform. A student could be signed up by their district or by their parent. Students who were registered by their district were done so using their Texas Unique ID. The students registered by the district could be matched to demographic information while students registered by parents could not.

PARTICIPATION

A total of 63,255 electronic EOY tests were administered. Due to print on demand capabilities of the PDF form, it was not possible to measure the number of paper test administrations in addition to this. Some Spanish language tests had as few as 39 students take the test, while over 4,000 took each of the lower grade Mathematics tests. About 13% of the tests taken were from parent registrations. A total of 49 districts or charter schools administered at least one electronic EOY assessment.

Over ten times as many BOY tests were administered as EOY tests, totaling 648,609. Once again, due to print on demand capabilities of the PDF form, it was not possible to measure the number of paper test administrations in addition to this. The number of electronic student testers by test title ranged from 232 to over 40,000 students. 334 different districts or charters participated in the electronic version of the BOY assessments, and only 0.01% of students who took the BOY tests were registered by parents.

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RESULTS

Scale score means and performance level distributions were calculated for the EOY and BOY tests. Table 1 presents the scale scores and performance level distribution for all students that took the EOY tests and table 2 presents the scale scores and performance level distributions for all students that took the BOY tests.

Since both the EOY and BOY tests were optional tests, the overall test results may not contain a representative sample of students from across the state. In order to enable comparisons of the EOY and BOY tests to previous STAAR tests, the demographic makeup of the sample was examined and compared to the 2019 STAAR population for the given grade and subject. The following variables were compared:

- Sex
- Ethnicity
- Economically Disadvantaged
- Limited English Proficient

Comparing these variables, differences were found between the EOY and BOY samples and the 2019 STAAR population. In order to enable comparisons between the EOY and BOY samples and the 2019 population, the EOY and BOY samples were sampled down using a stratified sampling technique in order to create a representative sample. Since demographic data were needed to create the stratified sample, parent-registered students were excluded from the new sample. EOY Spanish language tests had low participation to start and sampling down was not possible for these assessments.

Table 3 presents the scale score means and standard deviations for the 2019 STAAR administration and the sampled results for the EOY and BOY tests. Table 3 also includes the standard errors of measurement for each test, as well as the differences in the scale score means from 2019 STAAR to the EOY and BOY tests. Although the scores from the EOY sample were more similar to the 2019 results than those of the BOY sample, a relatively small number of students and school districts participated in the EOY assessment. **As such, the performance of the EOY sample, even with stratified sampling, is likely not generalizable to statewide student performance, and these differences should be interpreted with caution.**

The BOY samples for most tests represent a much larger and more representative sample of students than the EOY tests. Average scores on these tests were all lower when compared to the 2019 STAAR administration, with the most extreme drops coming from grades 4 and 8 mathematics, grades 5 and 8 science, Algebra I, and U.S. History.

Table 4 presents the performance level distributions for the 2019 STAAR administration and the sampled results for the EOY and BOY tests. Table 4 also includes the differences in the pass rates (*Approaches* or higher) from 2019 STAAR to the EOY and BOY tests. Once again, the EOY results are provided for comparison but should be interpreted with caution, as they represent a very small proportion of students across the state, and 32% came from one large ISD. The BOY tests did have decreases in the pass rates for all tests, including some very large differences. The largest decrease was observed in grade 5 science, where the pass rate dropped from 74% in 2019 to 22% on the BOY test. The only tests without double digit drops in the pass rates were the English I and II tests, which did not include the writing composition, so any comparisons of those tests to the 2019 administration should be made cautiously.

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DISCUSSION

One main goal of this research was to attempt to quantify the impact on student learning of the COVID-19 pandemic. The extended school closures and long-term remote instruction many students have experienced in the past nine months—in addition to the trauma of the pandemic itself, including the potential loss of financial resources and instability of food and housing—are likely to cause substantial academic impact. The data reported here provide a unique opportunity to compare students’ understanding of the curriculum at two different timepoints during the pandemic with that of previous years.

However, it is important to note that the EOY and BOY assessments were optional, non-proctored tests that were administered remotely. Making direct comparisons between the EOY/BOY scores and previous STAAR results is confounded by several factors, including differences in administration mode, test preparation, student and educator motivation, and timing within the school year. In addition, the EOY/BOY Writing and English I and II tests did not include writing composition, meaning that they were unlikely to measure writing in the same way as the STAAR versions of those tests.

Although differences in test administration, motivation, etc. make them less directly comparable with STAAR administrations, these tests were still constructed with the same blueprints (with the exception of writing composition) as the STAAR tests, using items with known measurement properties for students in a typical year. **Examining changes from 2019 to the 2020 BOY tests is intended to provide a starting point to try to quantify the impact on student learning of COVID-19.**

Estimating Potential Learning Loss

Because they were administered in the fall as opposed to the spring, the BOY test results are likely to show the impact of summer learning loss (e.g., Cooper et al., 1996). In other words, student performance may have decreased somewhat over the summer even without disruptions due to the pandemic.

To estimate the impact of a summer learning loss, students were identified who took both the EOY test and the BOY test for the same grade and subject. These are students who took, for example, a grade 3 EOY test in the spring as third graders, and then the grade 3 BOY test in the fall as beginning fourth graders. Changes in test performance from EOY to BOY cannot be ascribed to summer loss alone, of course. These students were also potentially affected by the factors described above, and the EOY samples are likely not representative of the statewide population. However, they are incorporated here as the best available source of estimating the size of a summer loss effect.

In order to estimate the net effect on student learning, two separate difference scores were calculated: one for the total change in performance from 2019 to BOY administration, and another for the change in performance from EOY to BOY for students who took both tests. The methods for calculating these changes were similar. For each effect, standardized mean scale score differences were calculated across the two time points for each grade and subject. Next, the summer loss results were subtracted from the 2019-to-BOY results. In order to put these changes on a more useful metric, the ‘summer learning loss’ mean differences

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were converted to ‘months of learning loss’ by dividing them by 2.5 (the typical length in months of summer break). Finally, the estimated pandemic effects (i.e., total minus summer) were converted to months as well by dividing by the respective ‘months of learning loss’ unit within each grade and subject.

Due to variability of these effect across grades and subjects—and especially due to the potential to over-interpret the summer loss results, which were based on small samples—the net effects were averaged across grades and subjects to provide an overall rough estimate of the learning loss due to the pandemic. Additionally, because several of the EOY-to-BOY samples (see Table 5) were quite small, tests with fewer than 250 students were omitted from the final calculation. **Based on these admittedly limited results, the effect on student learning from March 2020 through early fall 2020 appears to represent about 3.2 months of instructional loss, in addition to the typical 2.5 months of summer loss.**

Obviously, there are many limitations of this study. As previously mentioned, neither the EOY nor the BOY tests are perfectly comparable to the STAAR tests. These tests were administered remotely and in a non-proctored environment, and they were also optional, meaning that the students who took the tests were not a random sample of students across the state. One particularly influential calculation—that of the “summer learning loss” effect—is based on only a few hundred students per test. However, these effects were within the range of summer learning loss reported in previous studies (e.g., Paechter et al., 2015; Cooper et al., 1996).

References

- Cooper, H., Nye, B., Charlton, K., Lindsay, J., and Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review. *Review of Educational Research*, 66(3), 227–268. doi: 10.3102/00346543066003227
- Paechter, M., Luttenberger, S., Macher, D., Berding, F., Papousek, I., Weiss, E.M., and Fink, A. (2015). The effects of nine-week summer vacation: Losses in mathematics and gains in reading. *EURASIA Journal of Math, Science and Technology Education*, 11(6), 1339–1413. doi: 10.12973/eurasia.2015.1397a

Table 1. EOY Scale Score Means and Standard Deviations for All Students

EOY Grade and Subject	N	Scale Score Mean	Scale Score SD	Standard Error of Measurement	Did Not Meet	% At or Above Approaches	% At or Above Meets	% At or Above Masters
Grade 3 Mathematics	4,294	1508	166	53	21%	79%	62%	30%
Grade 4 Mathematics	4,021	1571	167	51	23%	77%	46%	27%
Grade 5 Mathematics	4,092	1649	175	52	15%	85%	56%	36%
Grade 6 Mathematics	3,641	1646	161	47	21%	79%	51%	22%
Grade 7 Mathematics	3,067	1679	175	48	23%	77%	52%	25%
Grade 8 Mathematics	2,717	1677	179	46	27%	73%	47%	16%
Grade 3 Reading	4,243	1485	179	53	17%	83%	61%	37%
Grade 4 Reading	3,923	1525	169	51	25%	75%	48%	27%
Grade 5 Reading	3,981	1568	184	51	24%	76%	50%	28%
Grade 6 Reading	3,580	1577	206	51	33%	67%	41%	24%
Grade 7 Reading	3,111	1659	218	50	27%	73%	50%	31%
Grade 8 Reading	2,723	1731	229	49	21%	79%	58%	44%
Grade 4 Writing	3,188	3961	798	290	26%	74%	49%	23%
Grade 7 Writing	2,515	4050	913	254	24%	76%	57%	26%
Grade 5 Science	3,427	3810	632	203	28%	72%	41%	18%
Grade 8 Science	2,426	4258	1020	239	19%	81%	63%	44%
Grade 8 Social Studies	2,285	4133	729	184	19%	81%	60%	46%
Algebra I	1,517	4022	752	164	22%	78%	57%	34%
English I	1,180	4008	822	170	32%	68%	57%	21%
English II	883	4017	913	187	31%	69%	57%	14%
Biology	1,066	4255	810	175	15%	85%	69%	35%
US History	918	4233	874	176	14%	86%	70%	42%
Grade 3 Spanish Mathematics	70	1404	263	55	31%	69%	47%	24%
Grade 4 Spanish Mathematics	39	1496	202	55	38%	62%	28%	15%
Grade 5 Spanish Mathematics	50	1611	240	54	28%	72%	60%	36%
Grade 3 Spanish Reading	79	1490	266	60	20%	80%	62%	52%
Grade 4 Spanish Reading	51	1512	225	65	29%	71%	47%	29%
Grade 5 Spanish Reading	73	1530	309	63	30%	70%	60%	30%
Grade 4 Spanish Writing	40	3871	1,009	349	38%	63%	43%	28%
Grade 5 Spanish Science	55	3529	743	188	49%	51%	31%	15%

Table 2. BOY Scale Score Means and Standard Deviations for All Students

BOY Grade and Subject	N	Scale Score Mean	Scale Score SD	Standard Error of Measurement	Did Not Meet	% at or Above Approaches	% at or Above Meets	% at or Above Masters
Grade 3 Mathematics	41,954	1369	126	46	50%	50%	17%	6%
Grade 4 Mathematics	43,198	1446	122	45	61%	40%	15%	6%
Grade 5 Mathematics	44,789	1534	122	44	40%	60%	23%	7%
Grade 6 Mathematics	41,305	1557	110	40	47%	53%	20%	5%
Grade 7 Mathematics	39,267	1592	110	40	46%	54%	21%	4%
Grade 8 Mathematics	27,052	1612	132	41	49%	50%	23%	5%
Grade 3 Reading	39,892	1385	144	47	39%	60%	29%	12%
Grade 4 Reading	41,003	1449	144	46	46%	54%	27%	12%
Grade 5 Reading	46,320	1495	142	44	44%	57%	29%	14%
Grade 6 Reading	43,820	1525	140	44	50%	50%	23%	10%
Grade 7 Reading	44,567	1592	142	43	43%	57%	31%	13%
Grade 8 Reading	32,888	1632	161	43	41%	59%	34%	19%
Grade 4 Writing	15,940	3309	576	263	65%	35%	13%	2%
Grade 7 Writing	16,373	3569	600	233	50%	50%	24%	7%
Grade 5 Science	14,815	3414	445	178	62%	37%	12%	3%
Grade 8 Science	13,423	3588	676	211	53%	46%	23%	12%
Grade 8 Social Studies	9,310	3537	574	175	61%	38%	19%	14%
Algebra I	14,143	3660	431	141	44%	57%	19%	8%
English I	35,009	3905	614	157	40%	60%	47%	10%
English II	16,384	3895	602	165	42%	58%	45%	6%
Biology	10,324	3931	595	166	29%	71%	39%	15%
US History	7,122	3839	531	139	33%	66%	38%	14%
Grade 3 Spanish Mathematics	1,354	1344	120	45	58%	42%	14%	4%
Grade 4 Spanish Mathematics	978	1408	114	44	73%	27%	9%	3%
Grade 5 Spanish Mathematics	232	1449	103	41	73%	28%	9%	2%
Grade 3 Spanish Reading	3,225	1339	158	55	47%	53%	26%	15%
Grade 4 Spanish Reading	2,606	1376	143	52	60%	40%	16%	5%
Grade 5 Spanish Reading	330	1435	146	52	62%	38%	16%	6%
Grade 4 Spanish Writing	714	3306	639	274	65%	35%	18%	6%
Grade 5 Spanish Science	272	3242	341	173	80%	20%	3%	1%

Table 3. Scale Score Means and Standard Deviations for 2019 STAAR and EOY/BOY Matched Samples

Grade and Subject	Spring 2019 STAAR				EOY 2020 Matched Sample				EOY Mean SS Diff from 2019	BOY 2020 Matched Sample				BOY Mean SS Diff from 2019
	N	SS Mean	SS SD	SE of Meas.	N	SS Mean	SS SD	SE of Meas.		N	SS Mean	SS SD	SE of Meas.	
Grade 3 Mathematics	374,259	1478	155	51	1,959	1503	169	53	25	23,451	1384	127	46	-94
Grade 4 Mathematics	394,964	1577	160	51	1,883	1565	166	51	-12	23,882	1465	125	45	-112
Grade 5 Mathematics	404,089	1651	163	49	2,227	1640	177	52	-11	24,992	1553	123	44	-98
Grade 6 Mathematics	401,216	1647	145	43	1,855	1636	150	46	-11	23,493	1573	114	40	-74
Grade 7 Mathematics	352,968	1660	140	44	1,463	1667	173	47	7	21,126	1599	112	40	-61
Grade 8 Mathematics	337,761	1712	143	45	1,131	1668	173	45	-44	11,440	1600	115	40	-112
Grade 3 Reading	356,913	1449	151	50	1,821	1488	180	53	40	21,957	1403	145	47	-46
Grade 4 Reading	380,162	1521	146	48	1,791	1533	163	50	12	22,454	1468	147	46	-53
Grade 5 Reading	394,750	1579	145	48	2,023	1568	182	50	-11	25,787	1516	145	45	-63
Grade 6 Reading	410,024	1574	139	44	1,827	1576	208	51	2	25,220	1540	143	44	-34
Grade 7 Reading	399,426	1654	145	43	1,431	1650	217	50	-4	25,119	1605	144	43	-49
Grade 8 Reading	392,556	1690	140	42	1,362	1723	220	49	33	16,665	1644	163	44	-46
Grade 4 Writing	379,120	3719	616	239	1,175	4003	788	286	284	4,134	3505	596	263	-214
Grade 7 Writing	399,570	3866	700	243	971	4028	877	253	162	4,284	3643	622	235	-223
Grade 5 Science	402,556	3913	575	199	1,467	3773	622	200	-140	3,389	3258	365	175	-655
Grade 8 Science	393,904	3999	617	205	1,091	4200	1010	239	201	2,157	3574	577	197	-425
Grade 8 Social Studies	395,567	3780	524	174	1,007	4080	749	187	300	1,489	3532	515	170	-248
Algebra I	416,354	4190	639	157	742	3958	704	164	-232	9,267	3668	426	140	-522
English I	467,850	3978	562	159	560	3994	776	171	16	24,709	3905	614	156	-73
English II	445,466	4017	546	164	471	3986	949	188	-31	11,192	3905	597	164	-112
Biology	409,371	4199	569	161	466	4286	771	175	87	6,185	3919	561	162	-280
US History	360,061	4352	547	155	446	4236	878	181	-116	4,376	3838	524	139	-514
Grade 3 Spanish	15,774	1417	137	49						824	1354	117	45	-63
Grade 4 Spanish	10,358	1497	139	46						583	1414	109	44	-83
Grade 5 Spanish	6,053	1537	150	45						37	1482	111	42	-55
Grade 3 Spanish Reading	33,060	1405	161	56						2,456	1349	158	55	-56
Grade 4 Spanish Reading	25,566	1458	153	55						2,038	1383	142	52	-75
Grade 5 Spanish Reading	15,979	1582	147	53						98	1467	141	49	-115

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Grade and Subject	Spring 2019 STAAR				EOY 2020 Matched Sample				EOY Mean SS Diff from 2019	BOY 2020 Matched Sample				BOY Mean SS Diff from 2019
	N	SS Mean	SS SD	SE of Meas.	N	SS Mean	SS SD	SE of Meas.		N	SS Mean	SS SD	SE of Meas.	
Grade 4 Spanish Writing	26,221	3820	672	252						271	3434	648	269	-386
Grade 5 Spanish Science	8,349	3498	486	182						124	3325	301	170	-173

Table 4. Performance Levels for 2019 STAAR and EOY/BOY Matched Samples

Grade and Subject	Spring 2019 STAAR					EOY 2020 Matched Sample					EOY Passing Rate Diff. from 2019	BOY 2020 Matched Sample					BOY Passing Rate Diff. from 2019
	N	% At or Below				N	% At or Below					N	% At or Below				
		Did Not Meet	Approaches	Meets	Masters		Did Not Meet	Approaches	Meets	Masters			Did Not Meet	Approaches	Meets	Masters	
Grade 3 Mathematics	374,259	22%	52%	76%	100%	1,959	22%	40%	71%	100%	0%	23,451	44%	79%	92%	100%	-23%
Grade 4 Mathematics	394,964	26%	54%	72%	100%	1,883	25%	55%	75%	100%	0%	23,882	54%	82%	93%	100%	-27%
Grade 5 Mathematics	404,089	17%	44%	64%	100%	2,227	16%	46%	66%	100%	1%	24,992	33%	72%	91%	100%	-16%
Grade 6 Mathematics	401,216	21%	55%	80%	100%	1,855	22%	53%	81%	100%	-2%	23,493	41%	76%	94%	100%	-20%
Grade 7 Mathematics	352,968	27%	59%	84%	100%	1,463	25%	50%	77%	100%	1%	21,126	43%	76%	94%	100%	-17%
Grade 8 Mathematics	337,761	19%	45%	84%	100%	1,131	30%	56%	85%	100%	-11%	11,440	51%	81%	97%	100%	-32%
Grade 3 Reading	356,913	24%	56%	72%	100%	1,821	17%	38%	61%	100%	8%	21,957	34%	66%	85%	100%	-10%
Grade 4 Reading	380,162	26%	57%	78%	100%	1,791	24%	51%	72%	100%	3%	22,454	41%	69%	86%	100%	-14%
Grade 5 Reading	394,750	23%	49%	71%	100%	2,023	25%	50%	72%	100%	-2%	25,787	38%	66%	83%	100%	-15%
Grade 6 Reading	410,024	34%	65%	83%	100%	1,827	34%	59%	76%	100%	0%	25,220	45%	73%	87%	100%	-11%
Grade 7 Reading	399,426	26%	53%	72%	100%	1,431	29%	52%	71%	100%	-2%	25,119	40%	66%	85%	100%	-14%
Grade 8 Reading	392,556	23%	47%	73%	100%	1,362	20%	43%	58%	100%	3%	16,665	38%	63%	79%	100%	-15%
Grade 4 Writing	379,120	35%	67%	90%	100%	1,175	24%	48%	76%	100%	12%	4,134	50%	77%	96%	100%	-15%
Grade 7 Writing	399,570	31%	60%	83%	100%	971	23%	43%	76%	100%	7%	4,284	46%	72%	90%	100%	-15%
Grade 5 Science	402,556	26%	52%	77%	100%	1,467	30%	62%	84%	100%	-4%	3,389	78%	95%	99%	100%	-52%
Grade 8 Science	393,904	21%	51%	76%	100%	1,091	20%	39%	60%	100%	1%	2,157	49%	77%	91%	100%	-28%
Grade 8 Social Studies	395,567	33%	65%	80%	100%	1,007	19%	43%	58%	100%	14%	1,489	58%	81%	88%	100%	-26%
Algebra I	416,354	16%	38%	61%	100%	742	23%	46%	70%	100%	-7%	9,267	42%	80%	92%	100%	-26%
English I	467,850	37%	51%	88%	100%	560	33%	45%	82%	100%	3%	24,709	40%	53%	90%	100%	-3%
English II	445,466	33%	49%	92%	100%	471	32%	45%	85%	100%	1%	11,192	41%	53%	93%	100%	-9%
Biology	409,371	12%	37%	74%	100%	466	14%	29%	65%	100%	-2%	6,185	28%	61%	86%	100%	-16%
US History	360,061	7%	25%	53%	100%	446	14%	29%	60%	100%	-6%	4,376	32%	61%	86%	100%	-25%
Grade 3 Spanish Math	15,774	34%	69%	88%	100%							824	55%	86%	95%	100%	-22%
Grade 4 Spanish Math	10,358	46%	74%	88%	100%							583	72%	92%	98%	100%	-25%
Grade 5 Spanish Math	6,053	43%	72%	87%	100%							37	57%	89%	97%	100%	-14%
Grade 3 Sp. Reading	33,060	31%	61%	79%	100%							2,456	44%	72%	83%	100%	-14%
Grade 4 Sp. Reading	25,566	41%	71%	88%	100%							2,038	59%	83%	95%	100%	-17%
Grade 5 Sp. Reading	15,979	20%	47%	79%	100%							98	51%	78%	91%	100%	-31%
Grade 4 Sp. Writing	26,221	33%	61%	85%	100%							271	57%	74%	92%	100%	-24%
Grade 5 Sp. Science	8,349	56%	82%	94%	100%							124	77%	96%	99%	100%	-21%

Table 5. Sample Sizes for Students Taking Both EOY and BOY Tests

Grade and Subject	N
Grade 3 Mathematics	613
Grade 5 Mathematics	551
Grade 6 Mathematics	487
Grade 7 Mathematics	412
Grade 8 Mathematics	157
Grade 3 Reading	585
Grade 4 Reading	513
Grade 5 Reading	495
Grade 6 Reading	240
Grade 7 Reading	453
Grade 8 Reading	242
Grade 4 Writing	334
Grade 7 Writing	313
Grade 5 Science	375
Grade 8 Science	199
Grade 8 Social Studies	196
Algebra I	212
English I	162
English II	136
Biology	2
US History	3