

## **Expert Feedback on the Mathematics Standards Revised Commissioner's Draft**

Submitted by Jacqueline Weilmuenster

September 19, 2011

**1. Is a complete and logical development of mathematics concepts followed for each grade level or course? What recommendations do you have for improvement?**

In general, there is a cohesive development of mathematics concepts from kindergarten to precalculus. I strongly recommend that a horizontal alignment document is developed to insure that overloading in a grade level or course does not occur. The review committee must spend some time determining the approximate calendar length of the proposed standards for the grade level or course to judge if the load is appropriate and if the instruction of the standards will be viable given the length of the school year.

The vertical alignment document will be as critical. When grade appropriateness and horizontal alignment are determined, it will be important to chart the placement and flow of concepts and topics to insure support for student learning. Review committees across grade bands must have time to meet and carefully track alignment.

**2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

The difference between inflated language and correct mathematical terminology needs to be made. Teachers can learn new terminology, however unfamiliar, if it succinctly and precisely describes the knowledge or skill being considered. Some recommendations will follow in my specific grade level and course feedback.

**3. Are there specific areas that need to be updated or reworked?**

Grades 5 through 7 have areas, especially in Number and Operation, that need more alignment.

**4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The Process Standards and the Content Standards are separate components and should be formatted as such. In the draft revisions, the Mathematical Process Standards appear to be the first content focal area for each grade level and course. The additions, placement, and clarifications in the revised Process Standards are important improvements. Missing content will be addressed in specific grade level and course feedback.

**5. Are the Student Expectations (SEs) clear and specific?**

At several points there are references to fluency in relation to strategies. I recommend that Review Committee members be given copies of *Adding It Up*, published by the National Research Council. All the aspects of mathematical proficiency are critical and are discussed in detail in this seminal report. Look at the definition of procedural fluency in grades 3-5 cited from The National Research Council's report, "Adding It Up". Procedural Fluency: skill in carrying out procedures flexibly, accurately, efficiently and appropriately.

Likewise, there are many references to real world problems or situations. Students need guidance in finding the mathematics in context, creating a mathematical model, and developing strategies to solve problems. This language might need some standardization within grade bands but the idea shouldn't be omitted.

**6. Is the subject area aligned horizontally and vertically?**

For the most part, I believe the revised draft is aligned. Again, careful attention within and between grade levels must be given, considering the length of the school year and the best placement of concepts for the majority of students. There are many critics of the grade level placement of concepts and skills in the Common Core State Standards. Many states have had standards that cover operations with different number systems at earlier grades, for example, but there is seems a lack of conclusive research to support equating rigor with acceleration. I believe, overall, the draft has addressed this issue in a way that guarantees student success while improving mathematics education in our state.

**7. Should consideration be given toward adding other courses at the high school level to provide more options for students?**

I strongly recommend that we stay with the courses in the Commissioner's Draft. I believe that the needs of the vast majority of our students are served with these proposed courses in preparation for continued learning and future careers.

**8. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

The vocabulary, definitions, and clarifying examples should be provided in a companion document, along with the alignment documents mentioned above. I like the idea of a detailed map of mastery of knowledge and skills expected from kindergarten to grade 12.

I'll make additional suggestions in the specific grade level and course feedback.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft - Kindergarten**

Submitted by Jacqueline Weilmuenster

September 19, 2011

- 1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added several important student expectations, which have strengthened the knowledge and skill statements. A SE that has been deleted, KNO2, might be important to support students coming to kindergarten with deficiencies.

- 2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

I don't see the need for the term "hierarchical inclusion" in successive numbers. Likewise, it may not be necessary to include the term "perceptual subitizing" in recognition of quantity. However, both of these concepts are building blocks in development of number and operation and must not be omitted. Understanding them enables the child to recall basic facts and become fluent in all operations in later grades.

In KN12, does "within" include 10 specifically? In KG05, I'm not familiar with "non-standard figures."

- 3. Are there specific areas that need to be updated or reworked?**

Perhaps the Number and Operations section should be reworded for more familiar terminology.

- 4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The content standards are rigorous and age-appropriate. None are missing that cannot be covered appropriately in language arts or social studies class.

- 5. Are the Student Expectations (SEs) clear and specific?**

I believe the revisions have helped greatly with clarity and specificity. Having the research to back up the changes is valuable.

- 6. Is the subject area aligned horizontally and vertically?**

Continue to work with the first and second grade committees to determine tight alignment.

- 7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that kindergarten students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft – Grade 1**

Submitted by Jacqueline Weilmuenster

September 19, 2011

**1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added several important student expectations that have strengthened the knowledge and skill statements. Skip counting by fives (useful for counting nickels) should not have been omitted, however.

**2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

In the introduction, section (II), *joining* and *combining* seem to denote the same action. I suggest changing *combining* to *changing*.

The phrase "in all positions" in 1N10-12 is troublesome. I suggest rewording the student expectations to indicate "missing sums and missing addends" in 1N10. Likewise, I suggest "missing results and quantities" in 1N11 and 1N12. In fact, there is overlap in these student expectations and 1A01-3. Look at Kindergarten for clarification of language.

Is the term *conceptual subitizing* critical in describing this important skill? Should this student expectation be moved with those addressing number patterns?

Fluency is addressed in 1N14 with applying basic fact strategies. This is a proficiency needing consistent interpretation and definition.

**3. Are there specific areas that need to be updated or reworked?**

The student expectations noted above should be clarified or combined. There should be more continuity between place value and the numbers used in addition and subtraction. Rewording is needed for 1N02.

**4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The content standards for grade 1 are rigorous and age-appropriate, with the exception of 1N02-5 in which the upper limit of 999 is too large for first graders. Expanded notation should be left for grade 2.

**5. Are the Student Expectations (SEs) clear and specific?**

I believe the revisions have helped greatly with clarity and specificity. Having the research to back up the changes is valuable.

**6. Is the subject area aligned horizontally and vertically?**

Work with kindergarten and second grade committees to determine tight alignment.

**7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development (skip counting to 130 in both Grade 1 and 2). Determine the skills that first grade students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft – Grade 2**

Submitted by Jacqueline Weilmuenster  
September 19, 2011

- 1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. There are several areas needing further changes for a complete and logical development of second grade concepts. Something that has been left out is the idea of benchmarks (0,  $\frac{1}{2}$ , 1) for estimation of size.

- 2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

Specifying the use of open number lines is a welcome addition, but clarify what is meant by "open". In the student expectation added between 2N13 and 2N14, the phrase "unknowns in all positions" is not clear or appropriate. Why has "number line" been replaced with "linear model" in 2M05?

- 3. Are there specific areas that need to be updated or reworked?**

Set models should be specified in addition to part-whole models to support 3N9. Also, the pictorial model for determining how many more identical fractional parts are needed to make a whole should be extended to show that a whole and a fractional part (unit fraction) equals the number of fractional parts (such as 1 and  $\frac{1}{3}$  would equal four  $\frac{1}{3}$ 's).

- 4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The content standards for grade 2 are rigorous and age-appropriate.

- 5. Are the Student Expectations (SEs) clear and specific?**

I believe the revisions have helped greatly with clarity and specificity. Having the research to back up the changes is valuable.

- 6. Is the subject area aligned horizontally and vertically?**

Work with first and third grade committees to determine tight alignment.

- 7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that second grade students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft – Grade 3**

Submitted by Jacqueline Weilmuenster  
September 19, 2011

- 1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. There are several areas needing further changes for a complete and logical development of third grade concepts.

- 2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

Are the fractions in 3N06-12 limited to those greater than zero but less than one or does these include fractions greater than one? I see a first reference to fractions greater than one in grade 4 (4N11). Clarify so that mixed numbers will be introduced in grade 2 if necessary.

- 3. Are there specific areas that need to be updated or reworked?**

Set models should be specified in addition to part-whole models to support 3N9. Also, the pictorial model for determining how many more identical fractional parts are needed to make a whole should be extended to show that a whole and a fractional part (unit fraction) equals the number of fractional parts (such as 1 and  $\frac{1}{3}$  would equal four  $\frac{1}{3}$ 's).

- 4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The content standards for grade 3 are rigorous and age-appropriate.

- 5. Are the Student Expectations (SEs) clear and specific?**

I believe the revisions have helped greatly with clarity and specificity. Having the research to back up the changes is valuable. There are some remaining questions.

Is there a way to specify that 3N17 is a definition of division?

- 6. Is the subject area aligned horizontally and vertically?**

Work with second and fourth grade committees to determine tight alignment.

- 7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that third grade students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft – Grade 4**

Submitted by Jacqueline Weilmuenster

September 19, 2011

**1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. There are several areas needing further changes for a complete and logical development of fourth grade concepts.

**2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

Continue the use of benchmark numbers terminology found in other grade levels in 4N10. In the reference to fractions greater than one (4N11), should the terminology of mixed number or improper fraction be introduced to support 4N18? It has been suggested that natural numbers be substituted for counting numbers in 4N13.

**3. Are there specific areas that need to be updated or reworked?**

There is a standard missing to address factors of numbers. This is needed to support generating fractions with common numerators or denominators (4N15). Also, to help with understanding 4N11, place 4N12 first, moving from the concrete to the more abstract.

**4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The content standards for grade 4 are rigorous and age-appropriate. There is a standard missing to address factors and multiples of numbers. This is needed to support generating fractions with common numerators or denominators (4N15) and for Algebra 1.

**5. Are the Student Expectations (SEs) clear and specific?**

I believe the revisions have helped greatly with clarity and specificity. Having the research to back up the changes is valuable. There are some remaining questions.

**6. Is the subject area aligned horizontally and vertically?**

There is some concern with introducing so many big ideas (adding and subtracting decimals, adding and subtracting fractions with common denominators, and comparing fractions with unlike numerators or denominators) in one grade level.

**7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that fourth grade students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft – Grade 5**

Submitted by Jacqueline Weilmuenster  
September 19, 2011

- 1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole.

- 2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

Rational numbers are referenced for the first time in 5N07. Clarification should be given.

- 3. Are there specific areas that need to be updated or reworked?**

Because of the amount of new concepts being moved down from grades 6-8, I recommend that division with decimals be postponed until grade 6, which is still a year earlier than we've addressed in the our current TEKS.

- 4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The content standards for grade 5 are rigorous and age-appropriate for the most part. The specification of fractions in 5A01 in solving two-step equations seems more suited to 6<sup>th</sup> grade.

- 5. Are the Student Expectations (SEs) clear and specific?**

I'm not sure why it's necessary to specify "positive" quotients when dividing with positive unit fractions and whole numbers (5N23).

- 6. Is the subject area aligned horizontally and vertically?**

There is some concern with introducing so many big ideas (multiplying and dividing decimals, adding and subtracting fractions with uncommon denominators, and multiplying and dividing unit fractions/whole numbers) in one grade level. I recommend putting division with decimals into grade 6 so that a fifth grade student could have enough time to establish a thorough understanding of division, working toward an efficient algorithm.

- 7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that fifth grade students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft – Grade 6**

Submitted by Jacqueline Weilmuenster  
September 19, 2011

- 1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. However, there is too much content for a single year.

- 2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

In 6P08, change “numbers” to “rational number equivalents” for clarity.

- 3. Are there specific areas that need to be updated or reworked?**

I strongly recommend a complete reworking of the Numbers and Operations and the Proportionality focal areas.

- 4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The development of percents is not well supported in the current version. Insert a student expectation between 6P03 and 6P08 to begin conceptual understanding, such as “represent percents using objects and pictorial models, including 10x10 grids, strip diagrams, and area models.”

Likewise, the conceptual development of integer operations must begin with modeling real world situations and continue through concrete and pictorial models. Otherwise, there will be little transfer if the algorithms are established in isolation (6N09).

Change 6P10 to indicate even more strongly that this is intended to establish the “part, percent, whole” idea of most percent problems. As it is stated, the treatment may be limited to representation by and solution of equations, both of which are just being introduced in 6A02-06. However, I feel that the use of percent in 6M07 is appropriate for grade 6.

In 6M01, add “arising from mathematical and real world problems” to develop the idea of data points.

- 5. Are the Student Expectations (SEs) clear and specific?**

Combine 6A06 and 6A07. Also, combine 6A05 and 6A08.

In 6A10 and 6A11, are the area formulas what are meant by the terms “relationships” and “equations”?

- 6. Is the subject area aligned horizontally and vertically?**

Because of the large number of new concepts and skills in grades 5 and 6, I recommend that division with decimals be postponed until grade 6. Because rational number operations are being solidified in grade 6, solving and representing solutions of inequalities be postponed until grade 7.

**7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that sixth grade students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner’s Draft – Grade 7**

Submitted by Jacqueline Weilmuenster

September 19, 2011

- 1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. However, there is too much content for a single year.

- 2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

In 7P01, insert “using multiple representations, including...” for clarity. In 7P06, insert “extend to the ratio” of the area of a circle to the square if its radius.

- 3. Are there specific areas that need to be updated or reworked?**

The student expectation added after 7A11 is not a good fit here. Writing equations to represent the angles relationships when parallel lines are cut by a transversal would be more appropriate in grade 8, and not necessarily as an algebraic standard.

- 4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

We need to establish the concept of volume of prisms resulting from the area of the base multiplied by the height, using concrete and pictorial models. This important idea has to come before 7A02-03. Write as “explain verbally and symbolically the relationship between the base area, height, and volume of a prism”.

- 5. Are the Student Expectations (SEs) clear and specific?**

In 7A06, are rhombi included because they are on the reference chart? This will change with the revisions to the TEKS. Rhombi are special cases of parallelograms and aren’t needed in this student expectation.

- 6. Is the subject area aligned horizontally and vertically?**

Extending the use of graphical or visual organizer with sets, which occurs only once in grade 5, is not on solid ground unless students see this way of classifying things in other subject areas. I think it is intended to help students understand the differences in natural, whole, and rational numbers and integers as sets of numbers. Find a way to communicate this intent.

Work with rational number operations should still include solving real world problems. Omit the student expectation between 7N01 and 7N02. Fluency should be expected in grade 8 instead.

- 7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that seventh grade students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft – Grade 8**

Submitted by Jacqueline Weilmuenster

September 19, 2011

- 1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. However, there are several areas needing additional work.

- 2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

Using the expectation of illustrating is problematic. Rewrite 8N01 as “use rational numbers to approximate irrational values on a number line. Include pi and irrational square roots of numbers less than 225.” I see no need for cube roots at this point. In 8A02, omit “illustrate and” and write as “explain verbally and symbolically”.

In 8P14, omit “initial value” unless limiting the applications to the first quadrant. Change 8P08 to “compare linear and non-linear situations as represented in tables, graphs and equations”. In 8A09, add “on both sides of the equal sign” for consistency.

- 3. Are there specific areas that need to be updated or reworked?**

In Number and Operation, reorder the student expectations: 8N01, a combination of 8N03 and 4, 8N01, and a combination of 8N02 and 5. In Proportionality, reorder 8P01 and 8P02.

- 4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

Take pyramids out of grade 7, add both their surface area and volume to grade 8. Add dilations to 8G01-3.

- 5. Are the Student Expectations (SEs) clear and specific?**

Rewrite 8P01 as “generalize that the ratio of corresponding sides of similar figures are proportional, including a figure and its dilation. Rewrite 8P02 as “identify the similarities and differences between a given figure and its dilation(s), such as angle measures, side lengths, and areas, including figures graphed on a coordinate plane.

- 6. Is the subject area aligned horizontally and vertically?**

With the effort to complete rational number operations by the end of grade 7 and introduce into eighth grade a large amount of content previously relegated to Algebra 1, there is a concern that our students will find it even more difficult to achieve fluency with operations.

- 7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that eighth grade students should have by the end of the year.

**Expert Feedback on the Mathematics Standards  
Revised Commissioner's Draft – Algebra 1**

Submitted by Jacqueline Weilmuenster

September 19, 2011

- 1. Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. However, there are several areas needing additional work. Additionally, I recommend that technology should be used more often and more creatively.

- 2. Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

Returning to the language of “parent function” is appreciated.

- 3. Are there specific areas that need to be updated or reworked?**

Look again at the Linear Functions, Equations, and Inequalities section for consistency and adequate information.

- 4. Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

Explicit instruction on factors and multiples is missing in the revised draft. This must occur in grade 4 or 5.

- 5. Are the Student Expectations (SEs) clear and specific?**

In A1L02-4, how is the mathematical or real world problem presented – verbally, tabularly, graphically?

In A1L10, should this include solving the linear inequalities?

In A1L15, there needs to be more specificity, such as is found in A1L17. Should the equations include one variable, two variables? Should they be solved for one of the variables?

In A1A14, omit “simple trinomials”

In A1A08, insert ...given “the value of” several of their terms.

- 6. Is the subject area aligned horizontally and vertically?**

Much of the linear function work has been moved to grade 8. This has allowed more emphasis on quadratic and exponential functions. Collaboration with middle school and Geometry committees will be critical in determining tight alignment.

- 7. Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that Algebra 1 students should have by the end of the year.

## Revised Commissioner's Draft – Geometry

Submitted by Jacqueline Weilmuenster

September 19, 2011

1. **Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. A great effort was made to bring refinement and clarity to the standards. I recommend that technology should be used more often and more creatively.

2. **Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

Including the terminology “multiple representations” is greatly appreciated. In GA01, must the fractional distance be less than one?

3. **Are there specific areas that need to be updated or reworked?**

None

4. **Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

The content is appropriate for the course of Geometry.

5. **Are the Student Expectations (SEs) clear and specific?**

Yes

6. **Is the subject area aligned horizontally and vertically?**

The vertical alignment is much improved, but continue to work with the grade 8 and Algebra 2 committees to achieve tight alignment. I believe the course is horizontally aligned as well.

7. **Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that Geometry students should have by the end of the year.

## Revised Commissioner's Draft – Algebra 2

Submitted by Jacqueline Weilmuenster

September 19, 2011

1. **Is a complete and logical development of mathematics concepts followed for this grade level? What recommendations do you have for improvement?**

The review committee has added, deleted, and clarified many student expectation, resulting in a much more coherent whole. I recommend that technology should be used more often and more creatively.

2. **Have the correct vocabulary and terminology been used? Where can changes be made for accuracy and/or clarity?**

The language has been tightened. In A2E02,  $b$  is used for two different purposes in the same student expectation. We need to choose a different letter, perhaps  $K$  for the parameters.

Unfortunately there is better usage of the term “multiple representations” throughout Algebra 1.

3. **Are there specific areas that need to be updated or reworked?**

None

4. **Are the mathematics concept/content statements grade-level appropriate? Are important concepts missing at any grade level?**

Look at the implications of A1Q03 and A2Q05 with regard to completing the square, which is addressed in A2Q07.

Also, should the language of “extraneous solutions” be added in A2Q09, A2Q11, and A2C13?

5. **Are the Student Expectations (SEs) clear and specific?**

Yes

6. **Is the subject area aligned horizontally and vertically?**

For the most part, but continue working with the Algebra 1 and Precalculus committees to achieve tight alignment of concepts and language.

7. **Do you have any other suggestions for ways in which the mathematics standards can be improved?**

Remove the mark-ups and look at the revised draft as a new document. Check for uniformity of language, precision in the way that student expectations are gauged, and flow of conceptual development. Determine the skills that Algebra 2 students should have by the end of the year.