PIEDMONT UNIFIED SCHOOL DISTRICT
Implementation of the Common Core Standards for Mathematics Curriculum
Answers to Frequently Asked Questions
Revised March 31, 2014

Starting in the 2014/15 school year, the mathematics curriculum taught in the Piedmont Unified School District will be changing. What follows are answers to frequently asked questions about these changes, compiled based on questions raised during the parent education and Curriculum Forum meetings held to date concerning Common Core mathematics. For a complete list of meetings concerning Common Core mathematics, see: http://www.piedmont.k12.ca.us/wp-content/uploads/2013/09/PUSD-Common-Core-Math-Curriculum-Implementation.pdf The District will update this document periodically.

Overview

Why change?

The mathematics curriculum currently taught in the Piedmont Unified School District is based on California State Standards adopted by the California State Board of Education (SBE) in 1997. The SBE has since reevaluated the 1997 standards and concluded that they are "a mile wide and an inch deep" – the standards cover too many topics in too little depth. Specifically, the SBE determined that the 1997 standards do not adequately prepare students for the mastery of algebra, which is considered essential to a student's success and continued interest and engagement in mathematics.

The SBE has now adopted the Common Core State Standards (CCSS) for mathematics curriculum. Adopted by 48 states, the CCSS are educational standards that describe the knowledge and skills students will need when they graduate from high school, regardless of their choice of college or career.[i]

The CCSS require a specific sequencing of mathematics concepts, and demonstrated proficiency in applying those concepts to solve problems, to build a foundation for the mastery of algebra. This approach is based on what is considered both cognitively and developmentally appropriate, to promote better comprehension and retention of math concepts. This approach is also based on the content and practice standards used to teach math in other developed countries where students typically outperform their United States' counterparts.[ii]

Adopting the new standards, the SBE determined that the CCSS are more rigorous than the 1997 standards, and provide a stronger foundation for more advanced math and for application of math concepts in the sciences.

In general terms, how do the CCSS differ from what we have now?

Under CCSS, students at all levels will focus on fewer math concepts and principles, and will be expected to develop greater mastery and conceptual understanding of each. There will be greater emphasis on understanding the connections among different math concepts, within and between grade levels.

The CCSS establish *content* standards (such as addition and subtraction for grades k-2). In addition, the CCSS establish standards for the *practice* of math. Students will be expected to develop greater problem-solving and reasoning skills, and explain and defend their thinking. These *practice* standards will be embedded at every level of math education.

Do all public school districts in California have to implement CCSS?

Yes. The District is working closely with the Alameda County Office of Education and other school districts to identify "best practices" concerning professional development, lesson plans, selection of textbooks and other support materials, sequencing of mathematics concepts, sequencing of courses at the middle and high school level, pathways for accelerated learning, and other aspects of implementation.

What about private schools?

For practical reasons, private schools are going through a similar process of implementing the CCSS math curriculum. This is partly because the College Board, the non-profit organization that administers programs to promote college readiness (including the SAT and Advanced Placement programs) played a significant role in advocacy for and adoption of the CCSS. To ensure that their students are prepared for Advanced Placement and college-level math, private schools are aligning their math courses with the CCSS. This is also because the movement across the country is toward this model of teaching mathematics.

Does this District have any discretion over how to implement the CCSS?

Yes. For example:

- ***Curriculum and Course Materials***

Although the CCSS establish *standards* for the math concepts and principles that students must learn in a particular course (for example, the ability to use a mix of ratios, fractions, proportions and percentages to solve a problem), the CCSS is not curriculum. Each District can innovate and develop its own curriculum to help students learn the concepts and principles needed to meet the CCSS standards. Similarly, each District may choose its own course materials and texts.

- ***Sequencing of Concepts***

Each district has discretion to follow either a "traditional" or "integrated" model for teaching math concepts. For example, under the traditional model of the CCSS, algebra and geometry concepts are taught as separate, successive courses over a period of three years (Algebra I, Geometry, Algebra II). Under an integrated model of CCSS, these concepts are blended over the same period of years (Integrated Math I, II, and III).

- ***Course Pathways***

Each district has discretion to determine how to support learners who require either additional challenge or additional support. In addition to a grade-level progression or

"pathway" through the math standards, each district may offer: pathways that "compress" courses to accelerate through the math standards; and pathways that "expand" courses to allow more time for mastery of content.

As discussed below, all District staff who teach math are working together to study the CCSS, develop lesson plans and instructional practices, and develop recommendations on each of the implementation issues identified above. At the same time, the District is working with the Alameda County Office of Education and surveying similar districts to explore the various options.

The District has a range of learners, and this will continue to be true after the CCSS are fully implemented. The guiding consideration during the development of the pathways and other implementation is how the District can best support all learners, whether they are able to accelerate through the curriculum, follow a grade-level progression, or require more time to master the math concepts. Other considerations include: the interrelationship between math and science courses and the need to ensure readiness for advanced science curriculum; the need for opportunities to compress or expand at multiple points and at points that correspond with cognitive development; consideration of student stress, particularly during junior year; and practical considerations concerning instruction and how the content standards can be coherently compressed or expanded.

Will there be opportunity for parent input?

Yes. The District is holding a series of parent education programs, Curriculum Forum meetings, and Board of Education meetings to help parents understand the changes taking place in the classrooms now and over the next few years. Please see http://www.piedmont.k12.ca.us/wp-content/uploads/2013/09/PUSD-Common-Core-Math-Curriculum-Implementation.pdf for the complete schedule of meetings, all of which are open to the public. All are encouraged to attend to learn more about how curriculum and classroom instruction will shift over the next few years, and to provide input concerning implementation of the CCSS.

For those who cannot attend any of these meetings, questions and comments about the implementation of the Common Core Standards may be addressed to your student's site principal or Randall Booker, Assistant Superintendent of Educational Services at rbooker@piedmont.k12.ca.us.

When will these changes be implemented?

Implementation will occur in phases over a period of several years. There will be several years of roll-out followed by evaluation, refinement, and further evaluation and refinement. This is the case in every school district in California. The SBE has indicated it expects that it will take about five years for districts to fully implement the new CCSS.

In this District, teachers at all levels are collaborating on implementation, to promote coherence between grade levels and to take advantage of the full range of expertise among District staff. Not surprisingly, teachers are already adapting their curriculum and instructional practices toward alignment with the CCSS. Nonetheless, these changes may not be obvious. As discussed below, it is likely that the first significant shift under the CCSS will begin in 6th Grade Math starting in the 2014/15 school year, and it will

take several years to evaluate and refine the curriculum, instructional practices, and learning assessments.

Will students still have the opportunity to take AP Calculus?

Yes. Although there are many decisions to be made concerning implementation of the CCSS, the District is committed to maintaining a pathway for qualified students to take AP Calculus. As some students need additional support, other students need to be challenged to maintain their interest and skill development in mathematics. Some students will choose to take college-level mathematics courses in high school, and the District is committed to providing a pathway to support this choice.

What support is available for math teachers?

During the current school year, professional development and common planning time for teachers is focusing on implementation of the CCSS. This is designed to help teachers: Incorporate the new standards; develop curriculum and instructional practices to help students meet these standards; identify course materials; and prepare for new methods for assessing student learning. The District is emphasizing collaboration among the math faculty and with math experts at the Alameda County Office of Education, and use of teacher-leaders and peer coaches. This model will continue throughout the implementation of the CCSS.

In the Words of the Educators:
What will CCSS look like when fully implemented?

As mentioned above, all District math teachers are collaborating on implementation of the CCSS. Considering how their instructional practices will change in the next few years, they describe the changes as including:

- More problem-solving tasks;
- less procedure practice;
- more context application;
- more emphasis on showing and explaining work;
- more consideration of the different approaches to solving a problem;
- more open-ended tasks;
- more discussion of the connections among math concepts;
- more embedding of math in science and other disciplines;
- more differentiation for mixed ability; and
- more peer observation and collaboration on instructional practices.

Considering how their students' practice will change under the CCSS, District staff determined that there will be more:

- Working and problem-solving in groups;
- presenting and explaining findings;
- applying math concepts to solve problems in a "real world" context;

- open-ended and ambiguous problems;
- learning from mistakes; and
- "what if" questions.

What Changes Can We Expect in the Next Few Years?

Elementary Level Mathematics

As discussed above, the CCSS require focus on fewer concepts and the ability to apply those concepts in a variety of ways. At the elementary level, the CCSS require focus on concepts, skills and problem solving relating to addition and subtraction (kindergarten through 2nd grade) and multiplication and division of whole numbers and fractions (3rd through 5th grade). The CCSS also eliminate some of the repetition currently found in the current 5th, 6th and 7th grade curriculum.

Similar to the changes in higher level math, elementary school math will become more rigorous than it is now because of the increased emphasis on conceptual understanding and application skills. This "rigor" is not about making math "harder" or introducing concepts at an earlier age. Instead, it is about requiring students to apply math concepts to solve problems in a variety of ways, and to explain their reasoning, to promote a deeper understanding of mathematics.

All elementary teachers are working together, across the three elementary sites and across grade levels, to modify curriculum for each grade level and link concepts across grade levels. Although the teachers are already incorporating some curriculum changes this year, there is significant work to be done over the next several years to fully implement and refine the new curriculum. There will be updates at parent club meetings, Site Council meetings, Curriculum Forum meetings, and Board of Education meetings. Updates will also be published in school bulletins and on the District website.

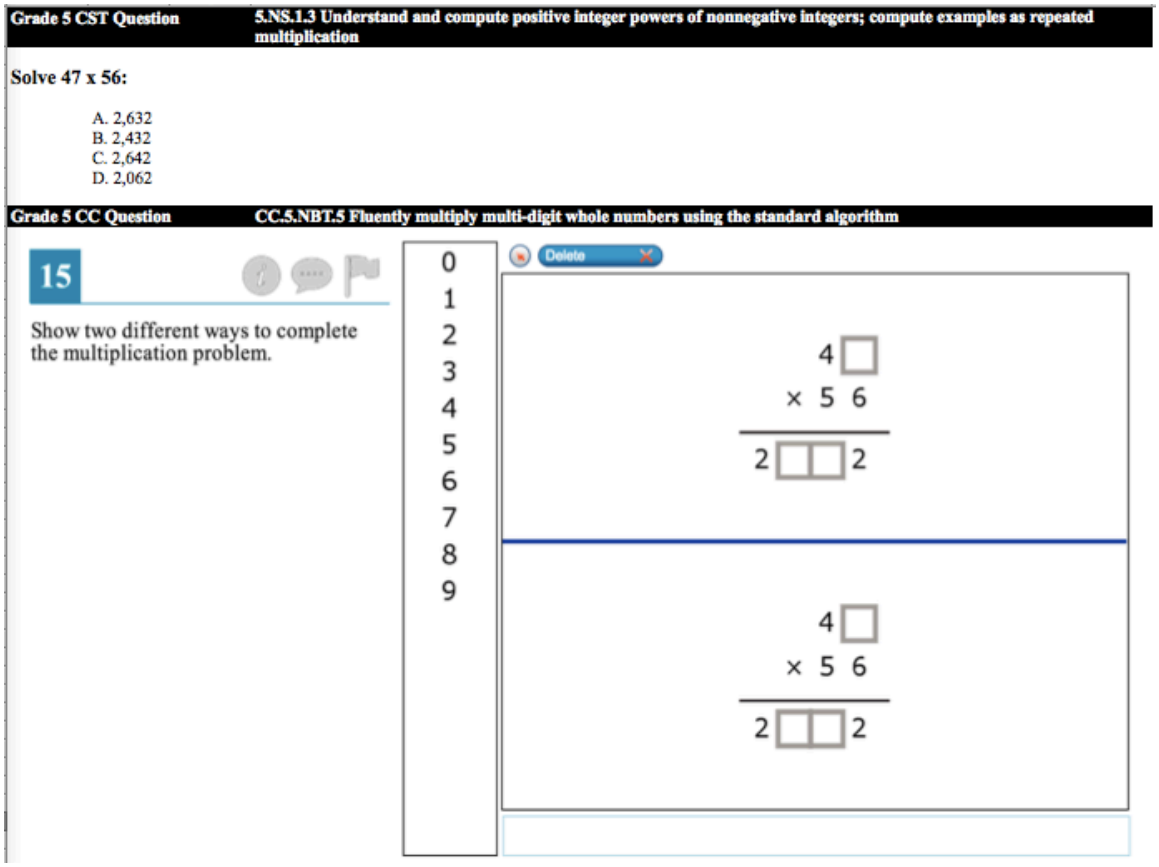
The Alameda County Office of Education drafted the following comparison of 5th grade math under the 1997 standards and 5th grade math under CCSS:

Key	5th Grade Math (1997 Standards)	6th Grade Math (1997 Standards)	New Common Core Content

5th Grade Math (1997 Standards)	5th Grade Math (CCSS) – CC5
Number Sense	Operations & Algebraic Thinking
• Positive/Negative Numbers	• Order of Operations
• Addition/Subtraction/ Multiplication/Division of Fractions	• Analyze Patterns
• Decimals/Percents	
• Rounding	Number Operations in Base 10
• Prime Factors	• Place Value with Fractions
	• Division with Whole Number Quotients
Algebra & Functions	• Order of Operations
• One Step Linear	• Decimals/Percents
• Distributive Property	
• Graphs & Tables (Coordinate Pairs)	Number Operations Fractions
	• Addition/Subtraction/Multiplication/ Division of Fractions
	• Real World Fraction Problems
Measurement & Geometry	
• Solid Shapes (Classification)	Measurement & Data
• Angles	• Units
• Units	• Solid Shapes (Rectangular Prism)
	• Line Plots with Fractions
Statistics & Data Analysis	
• Mean, Median, Mode	
• Display Data on Graphs	

Although this chart oversimplifies the comparison between the current 5th Grade Math and CC5 content standards, the chart helps illustrate the many changes underway at the 5th grade level, and that many of the topics now taught in 6th Grade Math will be introduced in CC5.

Another way to compare current 5th grade curriculum standards with CCSS 5th grade curriculum standards is to compare the learning assessments used with each. The following are a sample STAR test question for 5th grade math and a sample assessment question for CC5:



Grade 5 CST Question — **5.NS.1.3 Understand and compute positive integer powers of nonnegative integers; compute examples as repeated multiplication**

Solve 47 x 56:

A. 2,632
B. 2,432
C. 2,642
D. 2,062

Grade 5 CC Question — **CC.5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm**

15

Show two different ways to complete the multiplication problem.

0 1 2 3 4 5 6 7 8 9

Delete

$$\begin{array}{r} 4\square \\ \times\ 5\ 6 \\ \hline 2\square\square 2 \end{array}$$

$$\begin{array}{r} 4\square \\ \times\ 5\ 6 \\ \hline 2\square\square 2 \end{array}$$

(Differences between the current STAR testing and the new computer-adaptive assessments are discussed in greater detail below.)

Middle and High School Mathematics

- ***Current Course Progressions***

The three current course progressions under the current 1997 standards are summarized in the chart below. Also included are enrollment numbers for the 2013/14 academic year. Although these numbers change from year to year, they are included here to show the typical number of students progressing through each pathway.

As indicated in the chart, students have the opportunity to accelerate through the curriculum by skipping 6th Grade Math. At the end of 5th grade, students may take a test to determine whether they are eligible to skip 6th Grade Math in its entirety and advance to Pre-Algebra.

Also indicated in this chart, students who need additional support to master algebra have the opportunity to "expand" algebra into a two-year course. These students remain on a path to complete Math Analysis (also known as "Pre Calculus") and be prepared for college-level math. Note that the UC and CSU schools require three (and recommend four) years of college-preparatory math. Completion of the current Algebra I, Geometry, and Algebra II courses satisfies this requirement.

<table>
<tr><th colspan="8">CURRENT COURSE PROGRESSIONS UNDER THE (1997) STANDARDS</th></tr>
<tr><th>Grade</th><th colspan="2">Grade-Level Progression with a Second Year of Algebra</th><th colspan="3">Grade-Level Progression</th><th colspan="2">Accelerated Progression</th></tr>
<tr><td>6</td><td colspan="2"></td><td colspan="3">6th Grade Math (140)</td><td colspan="2">Pre-Algebra (35)</td></tr>
<tr><td>7</td><td colspan="2"></td><td colspan="3">Pre-Algebra (164)
↙ ↓</td><td colspan="2">Algebra I (46)</td></tr>
<tr><td>8</td><td colspan="2">Intro to Algebra (75)</td><td colspan="3">Algebra I (85)</td><td colspan="2">Geometry (31)</td></tr>
<tr><td>9</td><td colspan="2">Algebra I (76)</td><td colspan="3">Geometry (101)</td><td colspan="2">Algebra II (33)</td></tr>
<tr><td>10</td><td colspan="2">Geometry (58)</td><td colspan="3">Algebra II (85)</td><td>Stats (1)</td><td>Math Analysis (37)</td></tr>
<tr><td>11</td><td colspan="2">Algebra II (51)</td><td>Statistics (6)</td><td colspan="2">Math Analysis (82)</td><td>AP Calc AB (19)</td><td>Honors Stats (8)</td></tr>
<tr><td>12</td><td>Statistics (52)</td><td>Math Analysis (8)</td><td></td><td>AP Calculus AB (78)</td><td>Honors Stats (75)</td><td>AP Calc BC (23)</td><td></td></tr>
</table>

- ***A Note About Course Content and Course Names***

As noted above, a fundamental principle of the CCSS is that mastery of algebra is essential to a student's success and continued interest and engagement in mathematics. The CCSS require a specific sequencing of concepts, and demonstrated proficiency in applying those concepts to solve problems, to build a foundation for the mastery of algebra. In other words, the CCSS change the "scope and sequence" of middle school mathematics.

For example, some of the curriculum standards currently taught in Pre-Algebra (primarily to 7th graders) will now be taught to 6th graders in Common Core 6 (CC6). There will be

similar changes in content in CC7, to better prepare students for the more advanced concepts to come in CC8. (See the comparison charts on the following pages.)

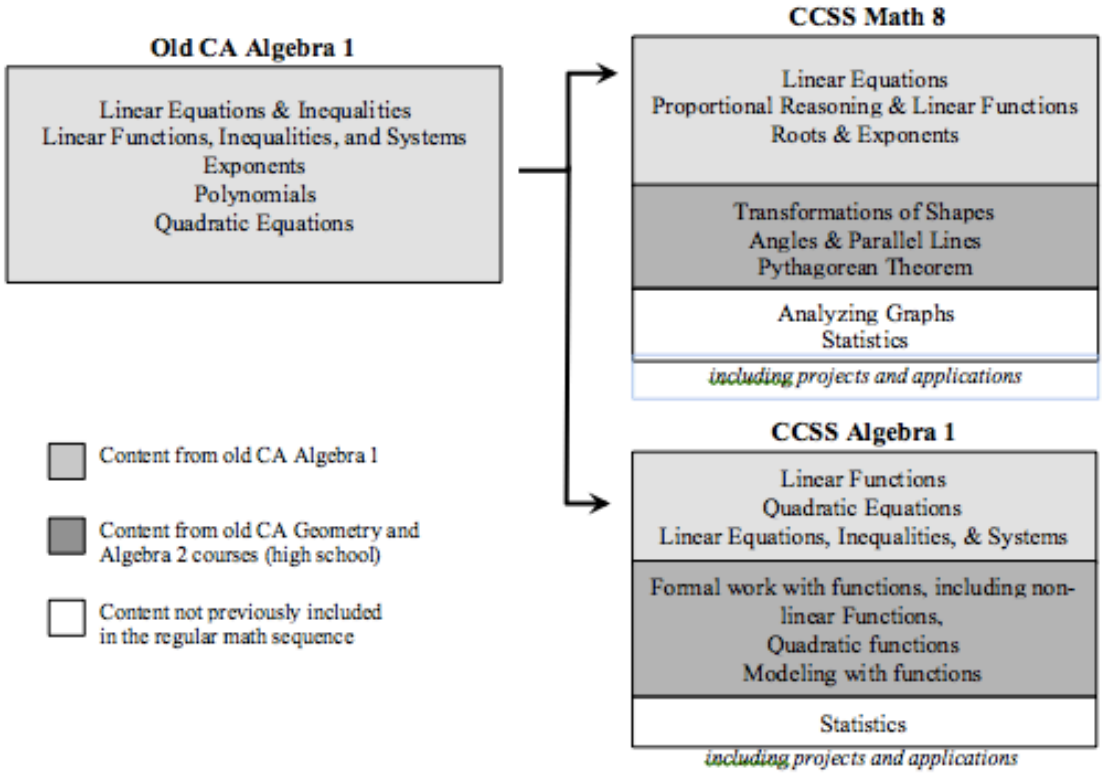
Although the new CCSS standards for middle school and high school mathematics are different from the 1997 standards, the course names may be the same or similar to current course names. This will almost certainly cause some confusion. For example, the current "Algebra I" course, which is taught primarily to 8th graders, bears little resemblance to the new "CC Algebra I," which is designed for 9th graders. The new course designed primarily for 8th graders, CC8, will have some of the same content but be more rigorous than the current "Algebra I." (See the comparison charts that follow.)

The Oakland Unified School District developed the following comparison of CC8 and Algebra I, to help illustrate how the CCSS change the scope and sequence of middle school mathematics:

Transition to the Common Core State Standards
CCSS Math 8 and CCSS Algebra 1

Increased rigor of the CCSS courses: defining Math 8 and Algebra 1

The standards that made up an Algebra 1 course under the old California State standards are divided between the CCSS Math 8 and CCSS Algebra 1 courses. Those CCSS-aligned courses also draw content from more advanced courses, and include content not previously taught in middle or high school:



The CCSS Math 8 course is composed of standards in three different domains: Algebra and Functions (approximately 65%), Geometry (approximately 25%), and Statistics (approximately 10%).
CCSS Algebra 1 ***builds on*** content that students learn in Math 8; it ***does not repeat*** Math 8 content.
Math 8 is not a course to be skipped.

The Alameda County Office of Education (ACOE) is developing similar comparisons between current 6th Grade Math and CC6, and current Pre-Algebra and CC7. Excerpts of the ACOE comparison charts follow on this and the following pages.

Key	6th Grade Math (1997 Standards)	7th Grade Math/ Pre-Algebra (1997 Standards)	8th Grade Math/ Algebra (1997 Standards)	New Common Core Content

6th Grade Math (1997 Standards)	**Pre-Algebra (1997 Standards)**
Number Sense	Number Sense
• Positive/Negative Numbers	• Positive/Negative Numbers
• Addition/Subtraction of Fractions	• Addition/Subtraction of Fractions
• Percentages	• Percentages
• Ratio and Proportion	• Integer Exponents
	• Scientific Notation
Algebra & Functions	Algebra & Functions
• One Step Linear	• One Step Linear
• Order of Operations	• Order of Operations
• Graphs & Tables (Ratio)	• Graphs & Tables (Ratio)
• Describe Geometry Algebraically	• Powers
	• Inequalities
Measurement & Geometry	Measurement & Geometry
• Solid Shapes	• Solid Shapes
• Angles	• Units
	• Perimeter & Area
	• Pythagorean Theorem
Statistics & Data Analysis	Statistics & Data Analysis
• Mean, Median, Mode	• Data Relationships
• Prediction	
• Sampling	

Although this chart oversimplifies the comparison between the current 6th Grade Math and Pre-Algebra content standards, the chart helps illustrate that many of the topics taught in 6th Grade Math are repeated in Pre-Algebra. As discussed below, this repetition (and repetition of math concepts from 5th grade in 6th Grade Math) made it possible for some students to skip 6th Grade Math.

Key	6th Grade Math (1997 Standards)	7th Grade Math/ Pre-Algebra (1997 Standards)	8th Grade Math/ Algebra (1997 Standards)	New Common Core Content

Common Core 6	Common Core 7
Ratio & Proportion	Ratio & Proportion
• Single Step Real World Problems	• Rates
• Percentages	• Multi-Step Real World Problems
• Units	
Number System	Number System
• Positive/Negative Numbers	• Rational Number Line Operations
• Addition/Subtraction of Fractions	• Absolute Value
• Order of Operations	• Multiplication/Division of Fractions
• Greatest Common Factor	• Graphing Equivalent Ratios
• Absolute Value	
• Graphs & Tables (Equations)	
Expressions & Equations	Expressions & Equations
• Exponents	• Percentage-Variable Addition Relationship
• One Step Linear	• Construct Equations
• Inequalities	• Graphing Inequalities
Geometry	Geometry
• Solid Shapes	• Scaling Drawings
• Triangles & Quads	• Construct Triangles
• Pythagorean Theorem	• 2D and 3D Transformations
• Perimeter & Area	• Area of a Circle
	• Angles
	• Solid Shape Volumes & Surface Area
Statistics & Probability	Statistics & Probability
• Variability in Sampling	• Data Analysis
• Means & Variances	• Visual Overlap
• Distributions	• Variability Inferences
	• Probability Models

Although this chart oversimplifies the comparison, it shows that many of the curriculum standards taught in Pre-Algebra (primarily to 7th graders) and some of the concepts taught in Algebra I (primarily to 8th graders) will be taught to 6th graders in Common Core 6 (CC6). Similarly, some of the curriculum taught in Algebra I will be taught in Common Core 7 (CC7). The chart also shows that there will be little repetition of CC6 curriculum standards in CC7.

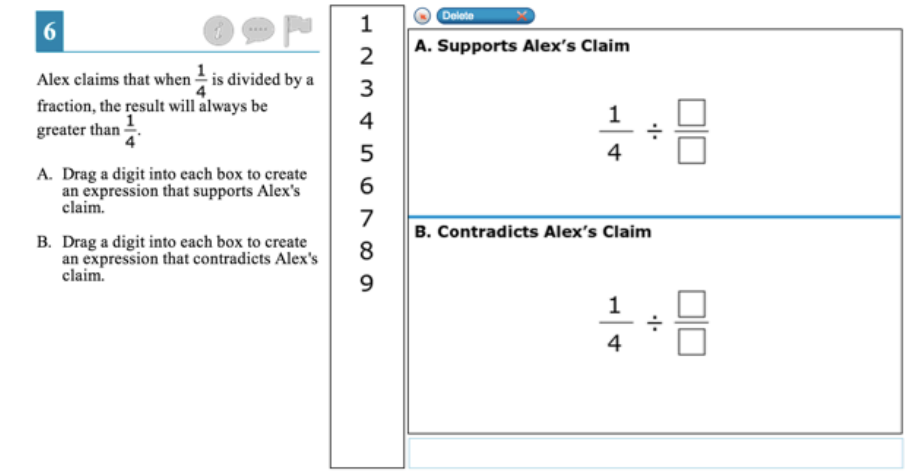
Another way to compare current Pre-Algebra standards with CC7 is to compare a STAR test question for the current 7th grade math with a sample assessment for CC7:

Grade 7 CST Question	7.NS.1.2 Add, subtract, multiply, divide fractions[Add, subtract, multiply, and divide rational numbers [integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.]

Divide 1/4 by 1/3.

A. 1/12
B. 1/7
C. 4/7
D. 3/4

Grade 7 CC Question	CC.7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.



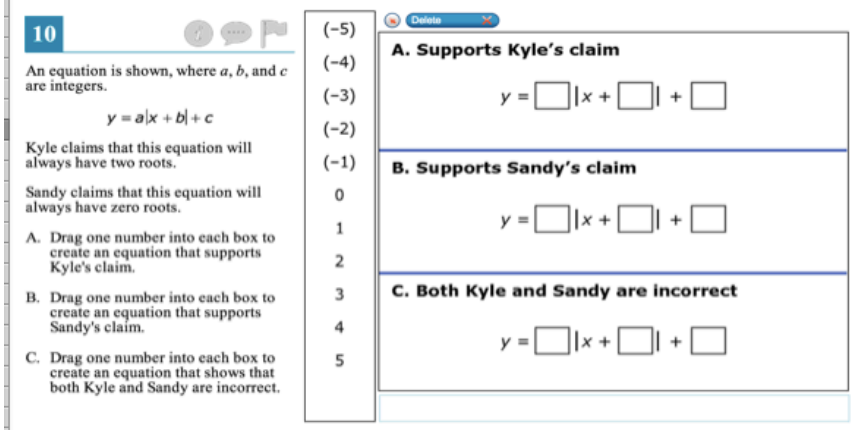
Similarly, what follows are a STAR test question based on 1997 Algebra standards and a sample assessment based on CC7 Algebra standards:

Algebra CST Question	Algebra.3.0 Students solve equations and inequalities involving absolute values

Solve for x in the equation: 11 = 2|x+4| + 5

A. Only -1
B. Only 7
C. -1 & -7
D. 1 & -7

Algebra CC Question	CC.5.NBT.5 Fluently multiply multi-digit whole



- ***CCSS Course Progressions***

The California State Board of Education adopted a model for CCSS course progression, for both traditional and integrated courses.[iii] In addition to determining whether to adopt a traditional or integrated course model, the District must develop alternate pathways to: "expand" courses for students who need additional time and support to master concepts; or "compress" courses to accelerate through the content.

As illustrated in the chart on page 8 above, titled "*Current Course Progressions Under The (1997) Standards*," students currently have alternatives to the typical mathematics course progression. Learners who need additional support to master algebra have the opportunity to "expand" algebra into a two-year course. Learners who pass a test at the end of 5th grade have the opportunity to accelerate through the curriculum by skipping 6th Grade Math in its entirety and advancing to Pre-Algebra.

Skipping 6th Grade Math in its entirety was once considered an appropriate pathway to accelerate through the math curriculum, because there is some repetition in the content taught in 5th grade, 6th Grade Math, and Pre-Algebra. However, the SBE has noted that some students who skip 6th Grade Math have a weak foundation for Algebra and difficulty reaching proficiency in higher-level mathematics.[iv]

Under CCSS, students will still have opportunities to accelerate through the curriculum. Rather than accelerate *by skipping* content, students will have opportunities to accelerate *by compression* – by moving through content at a faster pace.[v] The District is studying the pathways and options to compress curriculum adopted by the Oakland, San Ramon Valley, Berkeley and other school districts.

Decisions about when and how to accelerate by compression require further study. Compression may follow a range of models, and school districts may choose which curriculum to compress. Nonetheless, the CBE does not recommend compressing curriculum standards before 7th grade, to ensure that students are prepared and developmentally ready for both increased volume and advanced content.[vi]

For these reasons, although no decision has yet been made, it is likely that the first significant shift under the CCSS will begin in 6th grade math starting in the 2014/15 school year, with all 6th graders taking CC6. In contrast with the current pathways, where the main decision point concerning acceleration is at the end of 5th grade, it is likely that the first decision point for acceleration under the CCSS will come after completion of 6th grade.

As noted above, the guiding consideration during the development of the pathways is how the District can best support *all* learners. Other considerations include: the need for opportunities to *compress or expand at multiple points* and at points that correspond with cognitive development; practical considerations concerning how to compress two courses into one year, for example, or three courses into two years, etc.; the need to ensure student readiness for advanced science curriculum; the need to ensure opportunities for AP Calculus in high school; and consideration of student stress, particularly during junior year.

Discussion of model pathways will continue in public meetings through the Spring. For a complete list of meetings, see: http://www.piedmont.k12.ca.us/wp-content/uploads/2013/09/PUSD-Common-Core-Math-Curriculum-Implementation.pdf All are encouraged to learn about the options and provide input to the District.

- ***Why change to a heterogeneous Common Core Math 6?***

In March 2014, the District's math faculty met as a group and considered the reasons for: requiring that all students take CC6; and offering the option to compress math curriculum at a point later than the current decision point at the end of 5th grade. The reasons discussed are summarized here:

  - Under Common Core, curriculum is changing in 5th, 6th and 7th grade, eliminating the repetition that exists under the 1997 curriculum standards. It was this repetition that made it possible for some students to "skip" 6th Grade Math.
  - The CC6 curriculum will be more challenging than current 6th Grade Math, and a full year will be needed to establish a solid base of knowledge for the Common Core courses that follow.
  - Common Core math curriculum lends itself to differentiation in the classroom, because students who master the material quickly can achieve greater depth in the subject area. Students who require more time to master the material can be successful at their level, and benefit from having more advanced learners in the same class.
  - Experienced, single-subject credentialed math teachers are very able to differentiate curriculum for the full range of learners.
  - Teachers can use homogeneous grouping within a heterogeneous classroom.
  - The decision whether compression is the right choice for an individual student should be made after making the transition to middle school and after having the experience of CC6. The experience of CC6 and the learning assessments that accompany CC6 will help families make an informed choice about the appropriate math pathway for each student.
  - The end of fifth grade is too early to make a decision on a student's math pathway. It is more appropriate to make decisions about compression when student logic and mathematical reasoning is more developed.
  - Next fall's 6th graders will have new Common Core challenges in all subject areas. At this point, it appears to be "too much" to add math compression to these challenges. Delaying math compression is expected to reduce student stress.
  - The District needs to develop practical experience with the new curriculum standards and assess how students respond to the new challenges before considering pathways for compression.

- ***How Will the CC6 Teachers Manage the Broad Range of Learners?***

The CC6 and all mathematics teachers will have professional development and collaboration support for a range of implementation issues, including but not limited to

differentiation for the range of learners within each class. One 6th grade math teacher noted that when all CC6 teachers have a similar range of students in their class, they will be able to collaborate more efficiently and effectively on strategies and lesson plans for differentiation and support.

As mentioned above, CC6 is not the same as the current 6th Grade Math. CC6 will include concepts currently taught in Pre-Algebra, and will require greater depth and mastery of concepts. For this reason, the District anticipates that more learners may need additional support to master CC6, and fewer learners may need additional challenge.

- ***What is the likely impact on students already on the accelerated pathway or in high school?***

No decisions have yet been made about how the transition will affect these students. To the extent possible, the District will attempt to minimize disruption of the existing pathways.

It is likely that implementation will begin with the 6th grade in the 2014/15 school year, and then phase upward in successive years to include 7th and 8th grade mathematics. For this reason, it is possible if not likely that students already on the accelerated pathway or in high school will continue on their current path, with only modest shifts toward the new CCSS.

Before the District can make decisions about phasing-in the new CCSS for students already in middle and high school, the District will need to make decisions concerning whether to offer traditional or integrated courses.

The decisions about phasing-in the new CCSS for students already in middle and high school present some of the greatest challenges of implementation. For example, the new CC8 is designed for 8th graders, although the current pool of 8th graders is divided among three pathways – the pool of 8th graders is currently divided among Intro to Algebra, Algebra I, and Geometry.

Learning Assessments

Currently, students take the mandatory California STAR test to assess learning. In alignment with the new CCSS, the STAR test will be replaced with a new computer-based test called the California Assessment of Student Performance and Progress (CAASPP). (The CAASPP is also sometimes referred to as the "Smarter Balanced Assessment.") The CAASPP is a computer-based and computer-adaptive test that changes based on the individual student's correct or incorrect answers. The District will administer the CAASPP using the District's Chrome Books and computer labs.

This District was selected to pilot the CAASPP in Spring 2014, and the CAASPP will be implemented State-wide during the 2014/15 school year. The State's objective in conducting the field test is to evaluate test questions and give students a "dress rehearsal." The State does not plan to release the test data.

The District will take advantage of the field test to: evaluate whether its technical resources and capabilities meet the demands of administering the CAASPP; and prepare for a successful launch in the 2014/15 school year. Each year, students in grades 3rd – 8th and 11th will take the CAASPP. During the field test, students in 9th and 10th grade also will take the CAASPP.

Note that, based on the experience in other states that are a few years ahead of California in the implementation of the CCSS, test results in the first few years may be disappointing. As one parent noted, poor results in the first few years are to be expected and reflect "district shift rather than student competence."

To see sample CAASPP questions, see: http://www.cde.ca.gov/ta/tg/sa/practicetest.asp For more information on CAASPP, see: http://www.cde.ca.gov/ta/tg/sa/smarterfieldtest.asp

Conclusion

The new CCSS will be implemented in phases over the next several years. Many decisions have yet to be made, including: how and when to phase the implementation; development of curriculum and selection of course materials and texts; whether to follow a "traditional" or "integrated" model for teaching math concepts; how to support learners who require either additional challenge or additional support; and how and when to offer pathways to accelerate and pathways to allow more time for mastery of content.

These decisions will be made collaboratively with the mathematics staff and experts from the Alameda County Office of Education, and will be informed by the practices in other districts and other states, and by input from the parent community. All are invited to learn about the implementation options and provide input. Please see http://www.piedmont.k12.ca.us/wp-content/uploads/2013/09/PUSD-Common-Core-Math-Curriculum-Implementation.pdf for the complete schedule of meetings, all of which are open to the public. For those who cannot attend any of these meetings, questions and comments may be addressed to your student's site principal or to Randall Booker, Assistant Superintendent of Educational Services at rbooker@piedmont.k12.ca.us.

The implementation will be imperfect, and this will be the case in every district. Over the next few years, the District will continue to focus professional development and collaboration time on mathematics, to support the faculty and continually evaluate and refine curriculum and instructional practice. The driving considerations, throughout the implementation phase and beyond, will be support and increased opportunities for all learners.

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[i] For more information on the new Common Core standards, see www.piedmont.k12.ca.us/curriculum/common-core or www.cde.ca.gov/re/cc/

[ii] The declining performance of United States students on international mathematics assessments suggests that the United States' approach to mathematics education would be more effective by teaching fewer

concepts in greater depth. (Schmidt, McKnight, & Raizen, 1997.) Students in the United States are exposed to a broad range of mathematics topics but rarely study a concept in depth. In contrast, in high-performing countries, the approach is to focus on fewer concepts with a coherent progression among concepts.

[iii] *The Mathematics Framework*, adopted by the California State Board of Education on November 6, 2013.

[iv] *The Mathematics Framework*, citing Finkelstein, et al., 2012.

[v] *The Mathematics Framework*, Appendix A: Course Placement and Sequences, citing Wu 2012. "Mathematics is by nature hierarchical. Every step is a preparation for the next one. Learning it properly requires thorough grounding at each step and skimming over any topics will only weaken one's ability to tackle more complex material down the road." Skipping content in order to move to more advanced topics will no longer be considered good practice" (Wu 2012).

[vi] *The Mathematics Framework*, Appendix A: Course Placement and Sequences.