

Common Core Math Overview for Secondary

Organization of Standards and Smarter Balanced Assessment

The Common Core State Standards (CCSS) for Mathematics are organized by grade level in Grades K–8. At the high school level, the standards are organized by conceptual category, **not by courses**. These conceptual categories include: number and quantity, algebra, functions, geometry, modeling and probability and statistics. Additionally, there is a set of K-12 Mathematical Standards of Practice to develop the mathematical habits of mind for students to be successful throughout their math education.

Smarter Balanced Assessments will assess students' mathematical knowledge and habits of mind to demonstrate students' college and career readiness. In Grades 3-8, students will be assessed annually on their "Progress towards College and Career Readiness". At the end of Grade 11, students will be assessed on their "College and Career Readiness".

Districts must consider how to implement the CCSS, particularly in terms of how the high school CCSSs will be organized into courses that provide a strong foundation for post-secondary success.

In considering math sequences for the district, there are four things important to note:

1. There are Model Course Pathways listed in the CCSS. The pathways and courses are models, not mandates. They illustrate possible approaches to organizing the content of the CCSS into coherent and rigorous courses that lead to college and career readiness. States and districts are expected to develop and or adopt their own preferred pathway.
2. The course descriptions delineate the mathematics standards to be covered in a course; they are not prescriptions for curriculum or pedagogy. Additional work will be needed to create coherent instructional programs and units of instruction that help students achieve these standards.
3. Units within each course are intended to suggest a possible grouping of the standards into coherent blocks; in this way, units may also be considered "critical areas" or "big ideas" of a course. The ordering of the clusters within a unit follows the order of the standards document in most cases, not the order in which they might be taught. Attention to ordering content within a unit will be needed as instructional programs are developed.
4. While courses are given names for organizational purposes, states and districts are encouraged to carefully consider the content in each course and use names that they feel are most appropriate. Similarly, unit titles may be adjusted by states and districts.

Some Pathway Options (provided by CCSS)

The assessment system allows for flexibility in course pathway options. Consider the following points:

1. An approach typically seen in the U.S. (Traditional) that consists of two algebra courses and a geometry course, with some data, probability and statistics included in each course;
2. An approach typically seen internationally (Integrated) that consists of a sequence of three courses, each of which includes number, algebra, geometry, probability and statistics;
3. A “compacted” version of the Traditional pathway where no content is omitted, in which students would complete the content of 7th grade, 8th grade, and the High School Algebra I course in grades 7 (Compacted 7th Grade) and 8 (8th Grade Algebra I), which will enable them to reach Calculus or other college level courses by their senior year. While the K-7 CCSS effectively prepare students for algebra in 8th grade, some standards from 8th grade have been placed in the Accelerated 7th Grade course to make the 8th Grade Algebra I course more manageable;
4. A “compacted” version of the Integrated pathway where no content is omitted, in which students would complete the content of 7th grade, 8th grade, and the Mathematics I course in grades 7 (Compacted 7th Grade) and 8 (8th Grade Mathematics I), which will enable them to reach Calculus or other college level courses by their senior year. While the K-7 CCSS effectively prepare students for algebra in 8th grade, some standards from 8th grade have been placed in the Accelerated 7th Grade course to make the 8th Grade Mathematics I course more manageable;
5. Ultimately, all of these pathways are intended to significantly increase the coherence of high school mathematics.

The non-compacted, or regular, pathways assume mathematics in each year of high school and lead directly to preparedness for college and career readiness. In addition to the three years of study described in the Traditional and Integrated pathways, students should continue to take mathematics courses throughout their high school career to keep their mathematical understanding and skills fresh for use in training or course work after high school. A variety of courses should be available to students reflecting a range of possible interests; possible options are listed in the following chart. Based on a variety of inputs and factors, some students may decide at an early age that they want to take Calculus or other college level courses in high school. These students would need to begin the study of high school content in the middle school, which would lead to Pre - Calculus or Advanced Statistics as a junior and Calculus, Advanced Statistics or other college level options as a senior.

Compaction Guidelines

The Achieve Pathways Group has followed a set of guidelines⁷ for the development of these compacted courses.

- 1. Compacted courses should include the same Common Core State Standards as the non-compacted courses.** □ It is recommended to compact three years of material into two years, rather than compacting two years into one. The rationale is that mathematical concepts are likely to be omitted when trying to squeeze two years of material into one. This is to be avoided, as the standards have been carefully developed to define clear learning progressions through the major mathematical domains. Moreover, the compacted courses should not sacrifice attention to the Mathematical Practices Standard.
- 2. Decisions to accelerate students into the Common Core State Standards for high school mathematics before ninth grade should not be rushed.** Placing students into tracks too early should be avoided at all costs. It is not recommended to compact the standards before grade seven. In this document, compaction begins in seventh grade for both the traditional and integrated (international) sequences.
- 3. Decisions to accelerate students into high school mathematics before ninth grade should be based on solid evidence of student learning.** Research has shown discrepancies in the placement of students into “advanced” classes by race/ethnicity and socioeconomic background. While such decisions to accelerate are almost always a joint decision between the school and the family, serious efforts must be made to consider solid evidence of student learning in order to avoid unwittingly disadvantaging the opportunities of particular groups of students.
- 4. A menu of challenging options should be available for students after their third year of mathematics—and □ all students should be strongly encouraged to take mathematics in all years of high school.** Traditionally, students taking high school mathematics in the eighth grade are expected to take Precalculus in their junior years and then Calculus in their senior years. This is a good and worthy goal, but it should not be the only option for students. Advanced courses could also include Statistics, Discrete Mathematics, or Mathematical Decision Making. An array of challenging options will keep mathematics relevant for students, and give them a new set of tools for their futures in college and career.

Extension/Intervention Options

Significant intervention support and “catchup” opportunities are needed to ensure all students stay on track to demonstrate College and Career Readiness at the end of 11th grade.

These might include:

- Extending class time or blocking of classes in math;
- Allowing high school students to take two math courses simultaneously;
- Allowing students in block scheduled schools to take a math course in both semesters of the same academic year;
- Providing after school tutoring and rigorous summer math courses.

Additional Points to Consider

All students are assessed for Progress Towards College & Career Readiness at each grade level 3-8 and for College and Career Readiness (Algebra 1, Geometry & Algebra 2 including Statistics & Probability and Modeling) at the end of 11th grade.

Unlike '97 math standards and CSTs, each set of grades 6-8 CCSSs (& assessments) are centered on the math domains of number system, ratio & proportional reasoning, expressions and equations, geometry, and statistics & probability.

- Unlike '97 math standards and CSTs, there is a rigorous set of 8th grade CCSS standards (& assessment) that support students' success in high school mathematics.
- ***This year's 6th graders*** will be assessed at the end of their 8th grade year (2014-2015) on all 8th grade CCSS standards to demonstrate students' Progress Towards College and Career Readiness.

Unlike '97 math standards and CSTs, high school CCSSs are not divided into courses. There is a one-time, end of 11th grade assessment of the first three courses of high school math content (Algebra 1, Geometry & Algebra 2 including Statistics & Probability and Modeling).

- ***This year's 9th graders*** will be assessed in the end of their 11th grade year (2014-2015) on their College and Career Readiness.