

The Common Core State Standards (CCSS) in Mathematics for grades K-8 are organized by grade level and define specific content knowledge students should master by the end of each grade. The high school standards, however, define coherent blocks of mathematics content, without identifying at what grade students should master them, or in what type of course. Based on feedback from states, Achieve (in coordination with the CCSS mathematics writing team and additional experts) has created model course pathways in high school mathematics. These pathways show how the high school CCSS content might be organized into courses that prepare students for higher-level mathematics courses during the high school years and provide a strong foundation for, and pathways to, college and career readiness.

Two model course pathways have been developed, each of which consists of three courses that students would generally start in the ninth grade. Two additional pathways have been developed, which provide students the opportunity to reach Calculus by their senior year. Above all, the pathways are designed as voluntary models for states to consider for possible course organization.

What's in the Pathways?

The Traditional Pathway consists of two algebra courses and one geometry course, with some data, probability and statistics infused throughout each course. This pathway is typical of those found in many U.S. districts and schools. Unlike typical courses though, each of these courses prioritizes depth over breadth.

- ✓ **High School Algebra I:** This course includes a study of linear, quadratic, and exponential expressions, equations and functions, including modeling data with lines.
- ✓ **Geometry:** This course includes topics such as triangle congruence, similarity, rigid motions, properties of angles and figures including circles, proof, and trigonometry. It finishes with probability models such as geometric models for probability.
- ✓ **Algebra II:** This course focuses on rational and polynomial expressions, equations, and functions, as well as a continued study of probability and statistics. In contrast to typical Algebra II courses, this course gives additional emphasis to modeling, problem solving, and a more coherent and focused treatment of the included content.

The Integrated (or International) Pathway more closely resembles sequences seen internationally (although it can be found in some U.S. schools and districts), and consists of a sequence of three courses, each of which includes content from algebra, geometry, and data, probability and statistics.

- ✓ **Mathematics I:** The content in this course addresses linear and exponential relationships, data analysis, and geometry content with a specific focus on triangles.
- ✓ **Mathematics II:** The second course includes quadratics and other common functions, applications of probability, trigonometry and the study of circles.
- ✓ **Mathematics III:** This course and Algebra II closely mirror one another by requiring a coherent study of statistics and by addressing both polynomial and rational functions. This course includes additional geometry content including the trigonometry of general triangles.

What's Next?

Many students will finish their third course before their senior year, and the pathways were developed in a way that encourages additional mathematics in high school while taking into account that the choice of a fourth course will likely depend on students' needs, interests and post-high school plans. The pathways also provide descriptions of topics found in fourth courses. Students who complete either pathway through the end of the third course (Algebra II or Mathematics III) will be prepared for a host of options for a fourth mathematics course, including Precalculus, Advanced Statistics, Advanced Quantity and Modeling, or Discrete Mathematics.

Additional Pathways

Two additional pathways have been created to provide options for students who may want to study calculus in high school. These pathways "compact" content from three years into two. The Accelerated Traditional Pathway reorganizes Grade 8, High School Algebra I, and Geometry into 8th Grade Algebra I and Geometry in the 9th grade. This sequence prepares students for Algebra II in 10th grade. The Compacted Integrated (or International) Pathway reorganizes Grades 8, Mathematics I and Mathematics II into Grades 8 and 9, preparing students for Mathematics III in their sophomore year. In both cases, students are prepared for Precalculus in their junior year and Calculus in their senior year. While coherence is retained in both compacted pathways, the pace of the courses is faster than in the non-compacted courses. For this reason, students who consider taking compacted courses should be motivated and plan to take Calculus in their senior year.

Implementing the Pathways

The pathways and courses described here are models that illustrate possible approaches to organizing the CCSS content into coherent and rigorous courses that directly lead to credit-bearing postsecondary courses. The pathways are neither mandates nor prescriptions for curriculum or pedagogy. As such, states, districts and schools will need to supplement whatever course descriptions they use with curricular tools, professional development, and other materials to support their teachers.

Depending on current graduation requirements, some states may need to adjust their policies to include the courses necessary to reach the college- and career-ready threshold. In the case of the Traditional and Integrated (or International) Pathways, students would need to successfully complete the three courses, as described above, to reach the threshold – and should be encouraged to study mathematics through the end of their senior year in ensure readiness for credit-bearing, college mathematics.