

Quick Reference Guide: Making Decisions about Secondary Course Sequences

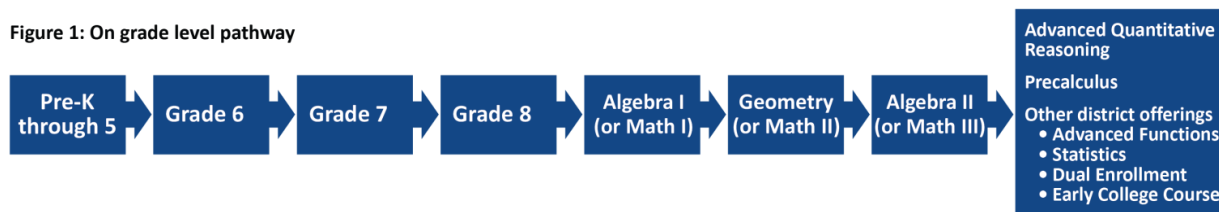
The 2017 *Massachusetts Curriculum Framework for Mathematics* represents an opportunity to revisit middle and high school course sequences. Content standards are grade-specific for grades pre-K–8, but districts and schools design their own high school courses. These courses must address the high school content standards, provide vertical coherence, and account for the varying goals of high school students. **This guide highlights the section called *Making Decisions about High School Course Sequences and Algebra I in Grade 8* (pp. 165–167) in the [Massachusetts Curriculum Framework for Mathematics](#).**

Decisions about secondary course-taking sequences should be made with the goal of identifying each student’s path to success and ensuring that all students who graduate from a Massachusetts high school and enroll in a Massachusetts public college or university may be placed into a credit-bearing math course.

On-Grade Sequence with Algebra I/Math I in Grade 9

Success in Algebra I/Math I is crucial to students’ continued achievement and engagement in math. The pre-K–8 standards in the 2017 Framework comprise a rigorous progression of skills and knowledge designed to provide a strong foundation for Algebra I/Math I in grade 9. As stated above, districts have discretion to design their own high school course sequences; however, Figure 1 shows a typical on-grade pathway. Students who successfully complete this pathway from pre-K through Algebra II/Math III will be prepared to take an advanced course such as the model Precalculus or Quantitative Reasoning course in grade 12. This sequence reflects the recommendations of the Massachusetts High School Program of Studies ([MassCore](#)), which includes four years of math coursework in grades 9–12.

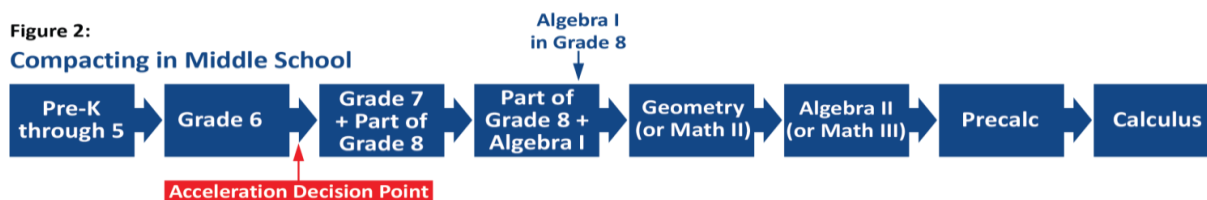
Figure 1: On grade level pathway



Compacting Middle School Standards with Algebra I/Math I in Grade 8

For students ready to move at a more accelerated pace, one option is to compress the grade 7, grade 8, and Algebra I (or Math I) standards into a two-year pathway. Compressing three years into two may allow students to enter Geometry (or Math II) in grade 9. This option is shown in Figure 2. Selecting and placing students into accelerated opportunities must be done carefully in order to ensure success. Students who follow a compacted pathway will be undertaking advanced work at an accelerated pace. This creates a challenge for these students as well as for their teachers. The standards for grades 6–8 are coherent, rigorous, and non-redundant, so offering high school coursework in middle school requires careful planning to ensure that all content and practice standards are fully addressed without compromising the level of rigor.

Figure 2:
Compacting in Middle School



Accelerated High School Pathways with Algebra I/Math I in Grade 9

Many students will seek the opportunity to advance to math courses beyond those included in the 2017 Framework (for example; Discrete Mathematics, Linear Algebra, AP Statistics, AP Calculus). This can be accomplished either by acceleration at the middle school level (as described above) or within grades 9–12. Below are some pathways that can prepare students for Calculus in grade 12. These models are specific to Calculus but also function as examples for sequences leading to other possible advanced courses. Districts are encouraged to work with their administrators, teachers, and curriculum coordinators to design pathways that best meet the interests and needs of their students.

- Figure 3 shows a “doubling up” model. By enrolling in Geometry/Math II simultaneously with Algebra I/Math I or Algebra II/Math III, students prepare for Precalculus in grade 11 and Calculus in grade 12.
- Figure 4 shows an “enhanced” model in which standards from the model Precalculus course are added to other courses in a high school pathway, allowing students to enter Calculus in grade 12 without enrolling in a stand-alone model Precalculus course.

Figure 3:

Doubling Up in High School

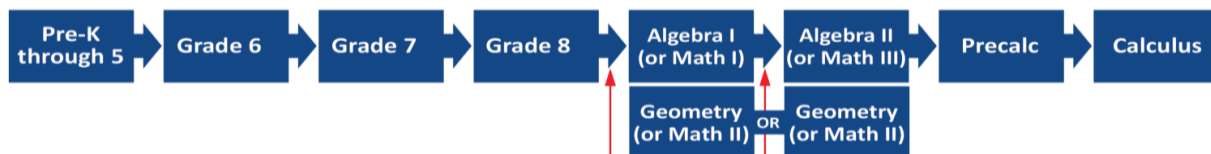


Figure 4:

Enhanced Pathway in High School



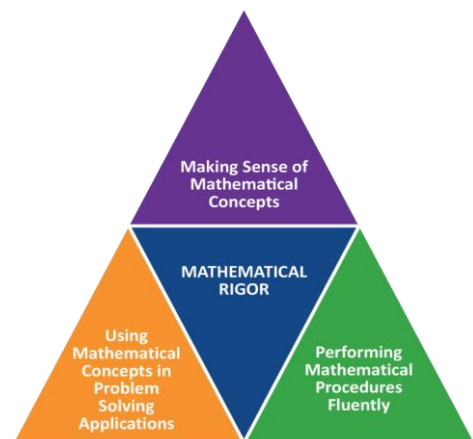
In addition to the pathways presented in Figures 3 and 4, schools may also consider these options, among others:

- Standards that focus on a sub-topic such as trigonometry or statistics may be used to create one-semester courses, allowing students to “double up” for less time.
- Standards from the model Math I, II, III course sequence or the model Algebra I, Geometry, Algebra II course sequence could be compressed into an accelerated two-year pathway, allowing students to enter the model Precalculus course in grade 11.

Balanced Mathematical Instruction

To achieve mathematical understanding, students should be actively engaged in **meaningful mathematics**. The standards focus on developing students’ conceptual understanding, procedural fluency, and problem-solving applications.

This emphasis on deeper mathematical understanding provides a gateway not only for discussions about instructional approaches in math but also for districts to work with their mathematics teachers and curriculum coordinators to design college and career pathways that best meet the needs and interests of their students.



Check It Out!

MassCore: <https://bit.ly/2Kgkgwk>