Ohio | Department of Education

Curriculum Choice Requirements for Mathematics Courses Beyond Geometry/Mathematics 2

Current Ohio law requires all students to earn four credits of high school mathematics. In a student's third year of high school, any student may elect not to meet the Algebra 2/Mathematics 3 requirement. In making this choice, a student is required to have a credit in Probability and Statistics, Computer Programming, Applied Mathematics*, Quantitative Reasoning or a course meeting the requirements described within this document.

Typically, the first two courses in the high school mathematics sequence are Algebra 1/Mathematics 1 and Geometry/Mathematics 2. To meet the requirements of a course beyond Geometry/Mathematics 2, the course should address mathematical reasoning through the Mathematical Practices, using fluencies in knowledge and skills in the application and extension of content from algebra and/or geometry.

MATHEMATICAL PRACTICES

The Standards for Mathematical Practice are essential in the extension of mathematical thinking. Students develop these habits of mind through orchestrated, intentional experiences of reading, writing, talking, listening and reasoning that connect mathematics to daily life and career situations.

While all of the Standards for Mathematical Practice are important in all courses, the following are predominant in a course beyond Geometry/Mathematics 2:

- Construct viable arguments and critique the reasoning of others (MP.3);
- Modeling with mathematics (MP.4);
- Attend to precision (MP.6); and
- Look for and make use of structure (MP.7).

FLUENCY

The following fluencies are developed within initial high school mathematics courses. They should be the foundation for extension and application to career and real-world situations.

Algebra/Functions	Students should look at algebraic manipulation as a meaningful enterprise in which they seek to understand the structure of an expression or equation and use properties to transform it into forms that provide useful information (e.g., features of a function or solutions to an equation). This perspective will help students continue to usefully apply their mathematical knowledge in a range of situations, whether their continued study leads them toward college or career readiness.
Geometry	The understanding of the criteria for triangle congruence and similarity is foundational in finding solutions to real-world problems involving triangles, quadrilaterals, circles, parallelism and trigonometric ratios. With the ability to use physical and computational construction tools, geometric models can be created. Geometric visualization becomes not only a tool for understanding algebra but also a tool in analyzing and solving problems. Students should experience the power found in using geometric understanding as a problem-solving tool.
Modeling	Seeing mathematics as a tool to model real-world situations should be an underlying perspective in everything students do, including writing algebraic expressions, creating functions, creating geometric models and understanding statistical relationships. This perspective will help students appreciate the importance of mathematics in daily life.

Statistics	Students should be able to create a visual representation of a data set that is useful in understanding or solving a problem.
Number and Quantity	In particular, students should recognize that much of mathematics is concerned with understanding quantities and their relationships. They should pick appropriate units for quantities being modeled, using them as a guide to understand a situation, and be attentive to the level of accuracy that is reported in a solution.

CONTENT

All mathematics courses should focus on a small number of topics taught in depth, with a balance among skills, understanding, reasoning and problem solving. The purpose in these courses is to develop the ability to tie together Number and Quantity, Algebra, Functions, Geometry and Statistics around a common theme, career or reasoning. Courses may be built from any of the content standards from the initial mathematics courses, the mathematical connections to a career pathway or relevant real-world problems. The curriculum should engage students in using mathematical models to solve real-world problems, through effective and accurate use of mathematical notation, vocabulary and reasoning. This is an opportunity to provide courses that directly connect the learning of school mathematics to the world students will embrace as graduates.

*Credit for an initial year of a two-year Algebra 1 or Mathematics 1 course, which has been coded in EMIS as an Applied Algebra 1 or Applied Mathematics 1, may not be used to satisfy the fourth credit of mathematics. An Applied Mathematics course must go beyond this initial learning.