Mathematics Grade 8 is a two-semester course that is 100% aligned to the Maryland College and Career Ready Standards for Mathematics. The course is designed to help students develop their algebraic reasoning, deepen their conceptual understanding, and apply mathematical practices. Students will focus on understanding functions — what they are, how to represent them, and how to use them to model mathematical and real-world situations. Students will then extend their understanding of functions to statistics, making scatterplots and using linear functions to model data. Additional topics include irrational numbers, simplifying exponential expressions, and solving equations and inequalities with variables on both sides. They will also learn about transformations and other geometric concepts, including the Pythagorean theorem and angle relationships, and surface area and volume of cylinders, cones, and spheres. They will design simulations to model compound probability. In addition, this course includes unit-level discussion activities in which students will learn techniques for having productive group conversations and will reflect on their own thinking and the thinking of others.

There are no required materials for this course.

Length: Two Semesters

Unit 1: The Number System

- The Real Number System
- Square and Cube Roots
- Approximating Irrational Numbers
- Ordering Real Numbers
- Wrap-Up: The Number System

Unit 2: Equations and Inequalities

- Solving Linear Equations
- Solving Linear Inequalities
- Modeling with Equations and Inequalities
- Wrap-Up: Equations and Inequalities

Unit 3: Exponents

- Properties of Exponents
- Scientific Notation
- Operations with Scientific Notation
- Wrap-Up: Exponents

Unit 4: Functions

- Identifying Functions
- Slope
- Slope and Unit Rate
- Graphs of Functions

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- Wrap-Up: Functions

Unit 5: Linear Functions

- Slope-Intercept Form
- Writing Linear Functions
- Modeling with Linear Functions
- Comparing Functions
- Wrap-Up: Linear Functions

Unit 6: Semester Wrap-Up

- Semester Wrap-up

Unit 7: Systems of Equations

- Solving Systems of Linear Equations by Graphing
- Solving Systems of Linear Equations by Substitution
- Solving Systems of Linear Equations by Elimination
- Wrap-Up: Systems of Equations

Unit 8: Angle Relationships and Triangles

- Geometric Drawings
- Angle Relationships
- Angle Relationships in Triangles
- Wrap-Up: Angle Relationships and Triangles

Unit 9: The Pythagorean Theorem

- The Pythagorean Theorem
- The Converse of the Pythagorean Theorem
- Distance on the Coordinate Plane
- Wrap-Up: The Pythagorean Theorem

Unit 10: Introduction to Statistics

- Scatterplots
- Linear Models in Data
- Frequency Tables
- Collecting and Analyzing Data
- Wrap-Up: Introduction to Statistics

Unit 11: Probability

- Probability
- Probability of Compound Events
- Simulations
- Wrap-Up: Probability

Unit 12: Semester 2 Exam

- Semester Wrap-Up

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