

Mathematics 8 delivers instruction, practice, and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. In this course, students focus on understanding functions — what they are, how to represent them in different ways, and how to write them to model mathematical and real-world situations. In particular, students investigate linear functions by learning about slope and slope-intercept form. Students' understanding of linear functions is extended to statistics, where they make scatter plots and use linear functions to model data. They solve linear equations and equations involving roots, and explore systems of linear equations. Additional topics include exponents, powers of ten, scientific notation, and irrational numbers. Students learn about transformations, and extend that understanding to an investigation of congruence and similarity. Other geometric concepts explored include the Pythagorean theorem, angle relationships, and volumes of cylinders, cones, and spheres.

The two-semester course is arranged in themed units, each with three to five lessons. Each lesson includes a variety of activities such as direct instruction, application of skills, performance tasks, and formative and summative assessments. Students engage with the subject matter in an interactive, feedback-rich environment as they progress through standards-aligned content and demonstrate their learning through computer- and teacher-scored assignments. By constantly honing the ability to apply their knowledge in abstract and real-world scenarios, students build the depth of knowledge and higher-order skills required to demonstrate their mastery when put to the test.

This course is built to state standards.

Length: Two Semesters

Unit 1: The Number System

- Rational and Irrational Numbers
- Approximating Irrational Numbers
- Properties of Exponents
- Powers of 10
- Scientific Notation
- Wrap-Up: The Number System

Unit 2: Functions

- Functions and Relations
- Slope
- Slope and Unit Rate
- Graphs of Functions
- Wrap-Up: Functions

Unit 3: Linear Functions

- Slope-Intercept Form
- Slope and Rate of Change
- Comparing Functions
- Writing Linear Functions
- Wrap-Up: Linear Functions

Unit 4: Solving Equations

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

Unit 5: Semester Wrap-up

Unit 6: Geometry and Measurement

- The Pythagorean Theorem
- The Converse of the Pythagorean Theorem
- Distance on the Coordinate Plane
- Volume of Cylinders
- Volume of Cones
- Volume of Spheres
- Wrap-up: Three-Dimensional Geometry

Unit 7: Transformations, Congruence, and Similarities, Part 1

- Basics of Transformations
- Transformations and Congruence
- Translations and Reflections on the Coordinate Plane
- Rotations on the Coordinate Plane
- Wrap-Up: Transformations, Congruence, and Similarity, Part 1

Unit 8: Transformations, Congruence, and Similarities, Part 2

- Similarity and Dilations
- Parallel Lines and Angle Relationships
- Angle Relationships in Triangles
- Wrap-up: Transformations, Congruence, and Similarities, Part 2

Unit 9: Introduction to Statistics

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

Unit 10: Semester 2 Exam