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: Real Numbers and Application

- The Real Number System
- Approximating Irrational Numbers
- Ordering Real Numbers
- Using Proportions to Solve Problems
- Markups, Discounts, and Percent Change
- Wrap-Up: Real Numbers and Application

Unit 2: Foundations of Algebra

- Equivalent Expressions
- Simplifying and Rewriting Algebraic Expressions
- Writing Linear Equations and Inequalities
- Identifying Functions
- Functions and Variables
- Wrap-Up: Foundations of Algebra

Unit 3: Linear Functions

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

Unit 4: Equations and Inequalities

- Solving Linear Equations
- Solving Linear Inequalities
- Solving Equations Using Roots
- Wrap-Up: Equations and Inequalities

Unit 5: Semester Wrap-Up

- Semester Wrap-Up

Unit 6: Angles and Triangles

- Angle Relationships
- The Pythagorean Theorem
- The Converse of the Pythagorean Theorem
- Wrap-Up: Angles and Triangles

Unit 7: Area and Volume

- Area and Perimeter
- Volume and Surface Area
- Cones and Pyramids
- Wrap-Up: Area and Volume

Unit 8: Transformations

- Basics of Transformations
- Transformations and Congruence
- Translations and Reflections on the Coordinate Plane
- Wrap-Up: Transformations

Unit 9: Statistics

- Populations and Samples
- Collecting Data
- Choosing a Data Display
- Wrap-Up: Statistics

Unit 10: Data and Probability

- Boxplots
- Scatterplots
- Linear Models in Data
- Collecting and Analyzing Data
- Independent and Dependent Events

- Wrap-Up: Data and Probability

Unit 11: Semester Wrap-Up

- Semester Wrap-Up