

Grade 8 Pre-Algebra 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

- Lesson 1: Rational and Irrational Numbers
- Lesson 2: Approximating Irrational Numbers
- Lesson 3: Properties of Exponents
- Lesson 4: Powers of 10
- Lesson 5: Scientific Notation
- Lesson 6: Wrap-Up: The Number System

UNIT 2: FUNCTIONS

- Lesson 1: Functions and Relations
- Lesson 2: Slope
- Lesson 3: Multiple Representations of Proportions
- Lesson 4: Graphs of Functions
- Lesson 5: Wrap-Up: Functions

UNIT 3: LINEAR FUNCTIONS

- Lesson 1: Comparing Functions
- Lesson 2: Slope-Intercept Form
- Lesson 3: Writing Linear Functions
- Lesson 4: Wrap-Up: Linear Functions

UNIT 4: SOLVING EQUATIONS

- Lesson 1: Solving Linear Equations
- Lesson 2: Solving Systems of Linear Equations
- Lesson 3: Solving Equations Using Roots
- Lesson 4: Wrap-Up: Solving Equations

UNIT 5: SEMESTER WRAP UP

- Lesson 1: Semester Wrap Up

UNIT 6: GEOMETRY AND MEASUREMENT

- Lesson 1: The Pythagorean Theorem
- Lesson 2: The Converse of the Pythagorean Theorem
- Lesson 3: Distance on the Coordinate Plane
- Lesson 4: Volume of Cylinders and Cones
- Lesson 5: Spheres
- Lesson 6: Wrap-Up: Geometry and Measurement

UNIT 7: TRANSFORMATIONS, CONGRUENCE, AND SIMILARITY, PART 1

- Lesson 1: Basics of Transformations
- Lesson 2: Transformations and Congruence
- Lesson 3: Transformations in the Coordinate Plane
- Lesson 4: Wrap-Up: Transformations, Congruence, and Similarity, Part 1

UNIT 8: TRANSFORMATIONS, CONGRUENCE, AND SIMILARITY, PART 2

- Lesson 1: Similarity and Dilations
- Lesson 2: Parallel Lines and Angle Relationships
- Lesson 3: Angle Relationships in Triangles
- Lesson 4: Wrap-Up: Transformations, Congruence, and Similarity, Part 2

UNIT 9: DATA AND STATISTICS

- Lesson 1: Scatterplots
- Lesson 2: Linear Models in Data
- Lesson 3: Frequency Tables
- Lesson 4: Wrap-Up: Data and Statistics

UNIT 10: SEMESTER WRAP UP

- Lesson 1: Semester Wrap Up