

Mathematics Grade 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: NUMBERS AND OPERATIONS

- Lesson 1: The Real Number System
- Lesson 2: Approximating Irrational Numbers
- Lesson 3: Ordering Real Numbers
- Lesson 4: Properties of Exponents
- Lesson 5: Scientific Notation
- Lesson 6: Wrap-Up: Numbers and Operations

## UNIT 2: LINEAR EQUATIONS AND INEQUALITIES

- Lesson 1: Solving Linear Equations
- Lesson 2: Solving Linear Inequalities
- Lesson 3: Writing Linear Equations and Inequalities
- Lesson 4: Systems of Linear Equations
- Lesson 5: Wrap-Up: Linear Equations and Inequalities

## UNIT 3: PROPORTIONAL RELATIONSHIPS

- Lesson 1: Identifying Functions
- Lesson 2: Slope
- Lesson 3: Slope and Unit Rate
- Lesson 4: Representing Proportional Relationships
- Lesson 5: Wrap-Up: Proportional Relationships

## UNIT 4: LINEAR FUNCTIONS

- Lesson 1: The Slope-Intercept Equation
- Lesson 2: Writing Equations for Linear Functions
- Lesson 3: Proportional and Non-Proportional Linear Relationships
- Lesson 4: Linear Models

- Lesson 5: Wrap-Up: Linear Functions

## **UNIT 5: DATA ANALYSIS**

- Lesson 1: Measures of Center and Variation
- Lesson 2: Populations and Samples
- Lesson 3: Scatterplots and Association
- Lesson 4: Trend Lines
- Lesson 5: Wrap-Up: Data Analysis

## **UNIT 6: SEMESTER WRAP-UP**

- Lesson 1: Semester Wrap-Up

## **UNIT 7: TRANSFORMATIONS, CONGRUENCE, AND SIMILARITY**

- Lesson 1: Transformations and Congruence
- Lesson 2: Translations and Reflections on the Coordinate Plane
- Lesson 3: Rotations on the Coordinate Plane
- Lesson 4: Similarity and Dilations
- Lesson 5: Wrap-Up: Transformations, Congruence, and Similarity

## **UNIT 8: TWO-DIMENSIONAL GEOMETRY**

- Lesson 1: The Pythagorean Theorem
- Lesson 2: The Converse of the Pythagorean Theorem
- Lesson 3: Distance on the Coordinate Plane
- Lesson 4: Parallel Lines and Angle Relationships
- Lesson 5: Angle Relationships in Triangles
- Lesson 6: Wrap-up: Two-Dimensional Geometry

## **UNIT 9: THREE-DIMENSIONAL GEOMETRY**

- Lesson 1: Surface Area of Prisms and Cylinders
- Lesson 2: Volume of Cylinders
- Lesson 3: Volume of Cones
- Lesson 4: Volume of Spheres
- Lesson 5: Wrap-up: Three-Dimensional Geometry

## **UNIT 10: MANAGING MONEY**

- Lesson 1: Saving Money
- Lesson 2: Loans and Repayment
- Lesson 3: Financially Responsible Decisions
- Lesson 4: Wrap-up: Managing Money

## **UNIT 11: SEMESTER 2 EXAM**

- Lesson 1: Semester Wrap Up