Mathematics I builds students' command of geometric knowledge and linear and exponential relationships. Students learn through discovery and application, developing the skills they need to break down complex challenges and demonstrate their knowledge in new situations.

Course topics include relationships between quantities; linear and exponential relationships; reasoning with equations; descriptive statistics; congruence, proof, and constructions; and connecting algebra and geometry through coordinates.

This course supports all students as they develop computational fluency and deepen conceptual understanding. Students begin each lesson by discovering new concepts through guided instruction, and then confirm their understanding in an interactive, feedback-rich environment. Modeling activities equip students with tools for analyzing a variety of real-world scenarios and mathematical ideas. Journaling activities allow students to reason abstractly and quantitatively, construct arguments, critique reasoning, and communicate precisely. Performance tasks prepare students to synthesize their knowledge in novel, real-world scenarios and require that they make sense of multifaceted problems and persevere in solving them.

This course is built to state standards.

Length: Two Semesters

Unit 1: Solving Equations and Inequalities

- Algebraic Properties and Expressions
- Solving Linear Equations
- Solving Multistep Linear Equations
- Solving Linear Inequalities
- Literal Equations
- Measurement and Units
- Performance Task: Problem Solving with Inequalities
- Solving Equations and Inequalities Wrap-Up

Unit 2: Functions

- Domain and Range
- Identifying Functions
- Graphs of Functions
- Adding and Subtracting Functions
- Functions Wrap-Up

Unit 3: Linear Equations

- Slope
- Slope-Intercept Equation of a Line

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- Graphing and Manipulating y = mx + b
- Point-Slope Equation of a Line
- Parallel and Perpendicular Lines
- Linear Inequalities
- Linear Equations Wrap-Up

Unit 4: Systems of Linear Equations

- Two-Variable Systems: Graphing
- Two-Variable Systems: Substitution
- Two-Variable Systems: Elimination
- Two-Variable Systems of Inequalities
- Systems of Linear Equations Wrap-Up

Unit 5: Exponents and Exponential Functions

- Exponents
- Exponential Functions
- Graphs of Exponential Functions
- Exponents and Exponential Functions Wrap-Up

Unit 6: Sequences and Functions

- Arithmetic Sequences
- Geometric Sequences
- Understanding Number Sequences
- Exponential and Linear Growth
- Sequences and Functions Wrap-Up

Unit 7: Semester 1 Exam

Unit 8: Foundations of Geometry

- Induction: The Search for Rules and Patterns
- Deduction: Making a Case
- The Look and Language of Logic
- Introduction to Proofs
- Basic Postulates in Geometry
- Planes and the Space of Geometry
- Intersecting Lines and Proofs
- Parallel Lines and Proofs
- Foundations of Geometry Wrap-Up

Unit 9: Triangles

- What Is a Triangle?
- The Angles of a Triangle
- Congruence
- Congruence Postulates
- Similar Triangles
- Similarity Theorems and Proportional Reasoning

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- Performance Task: The Parallax Problem
- Triangles Wrap-Up

Unit 10: Coordinate Geometry

- Midpoint Formula
- The Distance Formula
- Patterns and Lines
- Slope
- Equations of Lines
- Equations of Parallel and Perpendicular Lines and Proofs
- Coordinate Geometry with Polygons
- Area of a Triangle with Coordinate Geometry
- Area and Perimeter of Polygons with Coordinate Geometry
- Coordinate Geometry Wrap-Up

Unit 11: Constructions and Transformations

- Constructions
- Paper Folding
- Impossible Problems from Antiquity
- Transformations
- Symmetry
- Tessellations
- Constructions and Transformations Wrap-Up

Unit 12: Descriptive Statistics

- Measures of Center and Spread
- Dot Plots, Box Plots, and Histograms
- Describing Distributions
- Two-Way Frequency Tables
- Descriptive Statistics Wrap-Up

Unit 13: Data and Mathematical Modeling

- Two-Variable Data and Scatterplots
- Fitting Linear Models to Data
- Nonlinear Models
- Data and Mathematical Modeling Wrap-Up

Unit 14: Semester 2 Exam

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