Algebra 1 builds students' command of linear, quadratic, 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 problem-solving with basic equations and formulas; an introduction to functions and problem solving; linear equations and systems of linear equations; exponents and exponential functions; sequences and functions; descriptive statistics; polynomials and factoring; quadratic equations and functions; and function transformations and inverses.

This course supports students as they develop computational fluency, deepen conceptual understanding, and apply mathematical knowledge. Students discover new concepts through guided instruction and confirm their understanding in an interactive, feedback-rich environment.

A variety of activities allow for students to think mathematically in a variety of scenarios and tasks. In Discussions, students exchange and explain their mathematical ideas. Modeling activities ask them to analyze real-world scenarios and mathematical concepts. Journaling activities have students reason abstractly and quantitatively, construct arguments, critique reasoning, and communicate precisely. And in Performance Tasks, students synthesize their knowledge in novel, real-world scenarios, make sense of multifaceted problems, and persevere in solving them.

This course is built to state standards. Throughout the course, students are evaluated by a variety of assessments designed to prepare them for the content, form, and depth of state exams.

Length: Two Semesters

Unit 1: Foundations of Algebra

- Rational and Irrational Numbers
- Algebraic Properties and Expressions
- Solving Linear Equations
- Foundations of Algebra Wrap-Up

Unit 2: Solving Equations and Inequalities

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

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Unit 3: Functions

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

Unit 4: Linear Equations

- Slope
- Slope-Intercept Equation of a Line
- Point-Slope Equation of a Line
- Parallel and Perpendicular Lines
- Linear Inequalities
- Linear Equations Wrap-Up

Unit 5: 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 6: Exponents and Exponential Functions

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

Unit 7: Sequences and Functions

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

Unit 8: Semester 1 Exam

Unit 9: Polynomials

- What Is a Polynomial?
- Adding and Subtracting Polynomials
- Multiplying Binomials
- Multiplying Polynomials
- Polynomials Wrap-Up

Unit 10: Factoring Polynomials

- GCF and Factoring by Grouping

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- Factoring x² + bx + c
- Factoring ax² + bx + c
- Special Cases
- Factoring and Graphing
- Factoring Polynomials Wrap-Up

Unit 11: Quadratic Equations and Functions

- Solving Quadratic Equations
- Completing the Square
- The Quadratic Formula
- Graphs of Quadratic Functions
- Nonlinear Systems of Equations
- Linear, Quadratic, and Exponential Functions
- Performance Task: Pricing for Profit
- Quadratic Equations and Functions Wrap-Up

Unit 12: Undoing Functions and Moving Them Around

- Inverses
- Parent Functions
- Shifting Functions
- Stretching and Compressing Functions
- Transformations of Parent Functions
- Undoing Functions and Moving Them Around Wrap-Up

Unit 13: Descriptive Statistics

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

Unit 14: Data and Mathematical Modeling

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

Unit 15: Semester 2 Exam

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