

Algebra1 - (Completed Draft 2025-2026)

Mathematics

Grade(s) 8th - 10th, Duration 1 Year, 1 Credit
Required Course

Course Overview

Algebra 1 provides the students with the basic structures of algebra necessary for higher mathematics, science and technological endeavors. It introduces properties of the real number system. Emphasis is placed on operations and polynomials, factoring techniques, solving linear and quadratic equations, solving systems of equations, graphing functions, solving, and graphing inequalities and working with rational and radical expressions.

Timeframe	Unit	Scope And Sequence Instructional Topics
Ongoing	Unit 1: Algebra basics/introduction	1. Real Number Systems 2. Order of Operations 3. Evaluating Expressions 4. Matrices
Ongoing	Unit 2: Multi-step equations	1. One and Two Step Equations 2. Distributive Property 3. Translating Expressions, Equations, and Inequalities 4. Write and Solve Equations 5. Literal Equations 6. Multi-step Equations 7. Compound Inequalities
Ongoing	Unit 3: Functions and Relations	1. Coordinate Plane and Graph Review 2. Domain/Range and Vertical Line Test 3. Equations as Functions Dictionary 4. Equations as Functions 5. Function Notation 6. Zeros of Functions 7. Real World Graphs 8. Relations and Functions
Ongoing	Unit 4: Linear Equations	1. Slope from Graphs 2. Slope Intercept and Standard Form 3. X and Y Intercepts 4. Vertical and Horizontal Lines 5. Point Slope Formula 6. Parallel and Perpendicular Lines 7. Point Slope with 2 Points 8. Linear Functions 9. Characteristics of Linear Functions 10. Linear Equations in Standard Form 11. Linear Models and Point Slope 12. Slopes of Lines and Rates of Change
Ongoing	Unit 5: Systems of Equations	
Ongoing	Unit 7: Polynomials	1. Classifying Polynomials 2. Add and Subtract Polynomials 3. Factoring and Polynomial Review 4. Multiplying Monomials and Polynomials 5. Multiplying Binomials and Trinomials 6. Special Polynomial Product 7. Polynomial Review
Ongoing	Unit 8: Quadratics	1. Solving Quadratic Equations by Graphing 2. Solve Quadratic Equations by Factoring (a=1) 3. Solving Quadratics by Factoring (a=1) cont... 4. Solve Quadratics by Factoring (a is not 0) 5. Solve Quadratics by Square Roots 6. Solve Quadratics by $ax^2 + bx + c$ 7. Properties of Quadratic Equations 8. Solve Simple Quadratic Equations 9. Quadratic Roots and the Discriminant 10. Quadratic Formula 11. Vertex Form 12. Converting Between Forms

Course Details

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Unit: Unit 1: Algebra basics/introduction

Duration: Ongoing

Unit Description

This unit introduces the foundational language and tools of algebra. Students will explore the structure of the real number system, apply the order of operations, and evaluate algebraic expressions. They will also be introduced to matrices as an organizational tool for numbers and data. By the end of the unit, students will develop fluency with core algebraic conventions and problem-solving processes that support success in later units.

Topic: Real Number Systems

Duration: Ongoing

Topic Overview

The Real Number System is the foundation of Algebra and higher-level mathematics. In this topic, students will explore how numbers are organized into subsets—including natural numbers, whole numbers, integers, rational numbers, and irrational numbers. Students will learn the properties of real numbers and how these properties are used to simplify and solve mathematical problems.

Instruction will focus on classifying numbers, comparing and ordering values, and applying number properties such as commutative, associative, distributive, identity, and inverse. Students will also connect their understanding of real numbers to the number line, absolute value, and estimation strategies.

Learning Objectives

- Identify and classify numbers within the Real Number System.
- Explain the differences and relationships between rational and irrational numbers.
- Apply properties of real numbers to simplify expressions and solve problems.
- Use absolute value and ordering of real numbers in real-world contexts.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Order of Operations

Duration: Ongoing

Topic Overview

The Order of Operations establishes a consistent set of rules for simplifying and evaluating mathematical expressions. In this topic, students will review and apply the correct sequence—parentheses, exponents, multiplication and division, and addition and subtraction (PEMDAS)—to ensure accuracy when solving problems.

Students will practice simplifying expressions with multiple steps, including those involving fractions, decimals, and negative numbers. Emphasis will be placed on recognizing how improper application of the order of operations can lead to incorrect results, as well as using these rules in both numerical and algebraic contexts.

Learning Objectives

- Apply the order of operations correctly to simplify numerical and algebraic expressions.
- Identify and avoid common errors that occur when evaluating multi-step problems.
- Use grouping symbols, exponents, and fractions appropriately in calculations.
- Connect the order of operations to real-world problem-solving where multiple steps must be performed in sequence.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Evaluating Expressions

Duration: Ongoing

Topic Overview

Evaluating expressions is a key skill in algebra that connects numerical problem-solving to variable-based reasoning. In this topic, students will practice substituting values for variables and applying the order of operations to simplify expressions accurately. They will work with integers, fractions, decimals, and exponents to build confidence in handling different types of numbers within expressions.

Instruction will emphasize interpreting variables as unknowns and as quantities that can change, reinforcing the importance of precision when performing substitutions and simplifications. Students will also connect evaluating expressions to real-world contexts, such as calculating costs, distances, or measurements based on given conditions.

Learning Objectives

- Substitute values for variables in algebraic expressions.
- Apply the order of operations to simplify expressions correctly.
- Evaluate expressions containing integers, fractions, decimals, and exponents.
- Interpret evaluated expressions in real-world problem contexts.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Matrices

Duration: Ongoing

Topic Overview

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Matrices are an organized way to display and work with numbers, data, and information. In this topic, students will learn how to read, write, and interpret matrices, understanding rows, columns, and elements. They will perform basic operations such as addition, subtraction, and scalar multiplication, and explore simple real-world applications like organizing data, calculating totals, or representing patterns.

Instruction will emphasize the use of matrices as a tool for solving problems efficiently and recognizing patterns, preparing students for more advanced topics in algebra and higher-level math.

Learning Objectives

Identify the parts of a matrix: rows, columns, and elements.

Read, write, and interpret matrices in context.

Perform basic matrix operations, including addition, subtraction, and scalar multiplication.

Apply matrices to organize data and solve simple real-world problems.

Priority Learning Objective = ★

Learning Objectives linked to Essential Standard = ⚡

Unit: Unit 2: Multi-step equations

Duration: Ongoing

Unit Description

In this unit, students extend their understanding of equations and inequalities by solving increasingly complex problems. They will review one- and two-step equations, apply the distributive property, and translate between verbal, numerical, and algebraic representations. Emphasis will be placed on writing and solving literal equations, working with multi-step equations, and solving compound inequalities. Students will develop the ability to model and solve real-world situations using equations and inequalities, a critical skill for both mathematics and applied contexts.

Topic: One and Two Step Equations

Duration: Ongoing

Topic Overview

Solving one- and two-step equations is a foundational skill in algebra that allows students to find unknown values in mathematical relationships. In this topic, students will learn strategies to isolate variables and solve equations using inverse operations, including addition, subtraction, multiplication, and division.

Instruction will focus on understanding the balance concept—whatever is done to one side of an equation must be done to the other—and applying this consistently to maintain equality. Students will also connect these skills to real-world scenarios, such as solving problems involving money, distance, or quantities, helping them see the practical applications of algebra.

Learning Objectives

Solve one-step equations using addition, subtraction, multiplication, or division.

Solve two-step equations that require a combination of operations.

Apply the concept of equality and inverse operations to maintain balance in equations.

Represent and solve real-world problems using one- and two-step equations.

Priority Learning Objective = ★

Learning Objectives linked to Essential Standard = ⚡

Topic: Distributive Property

Duration: Ongoing

Topic Overview

The Distributive Property is a key algebraic principle that allows students to simplify expressions and solve equations efficiently. In this topic, students will learn how to multiply a single term across terms inside parentheses, and how to combine like terms to simplify expressions.

Instruction will emphasize understanding the property as a tool for rewriting expressions and solving equations, as well as recognizing its role in factoring and expanding polynomials in later units. Students will also practice applying the distributive property in real-world contexts, such as calculating areas, costs, or quantities that involve grouping.

Learning Objectives

Apply the distributive property to expand expressions.

Simplify expressions by combining like terms after distribution.

Use the distributive property to solve one- and multi-step equations.

Recognize real-world situations where the distributive property is useful.

Priority Learning Objective = ★

Learning Objectives linked to Essential Standard = ⚡

Topic: Translating Expressions, Equations, and Inequalities

Duration: Ongoing

Topic Overview

Translating between words and mathematical symbols is a crucial skill in algebra that allows students to represent real-world situations mathematically. In this topic, students will learn how to write algebraic expressions, equations, and inequalities based on verbal descriptions, and how to interpret mathematical statements in context.

Instruction will emphasize identifying key phrases, understanding variable representation, and accurately modeling relationships. Students will

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also practice translating complex statements involving operations, comparisons, and multiple steps. This skill helps bridge the gap between abstract algebra and practical problem-solving.

Learning Objectives

- Translate verbal descriptions into algebraic expressions.
- Write equations and inequalities from word problems.
- Interpret expressions, equations, and inequalities in real-world contexts.
- Apply these skills to solve problems involving unknown quantities.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ✚

Topic: Write and Solve Equations

Duration: Ongoing

Topic Overview

Writing and solving equations allows students to model and solve real-world problems algebraically. In this topic, students will practice translating word problems into equations and then applying algebraic techniques to find the value of unknowns. Emphasis will be placed on understanding the relationship between operations and maintaining equality on both sides of the equation.

Instruction will include strategies for identifying key information in a problem, choosing appropriate operations, and systematically solving for the variable. Students will also connect their solutions back to the context of the problem to ensure they make sense in real-life situations.

Learning Objectives

- Translate word problems into algebraic equations.
- Solve one-step, two-step, and multi-step equations accurately.
- Check solutions by substituting values back into the original equations.
- Apply equations to model and solve real-world scenarios.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ✚

Topic: Literal Equations

Duration: Ongoing

Topic Overview

Literal equations are equations in which multiple variables are present, and the goal is to solve for one specific variable in terms of the others. In this topic, students will practice isolating a chosen variable using inverse operations while maintaining equality. This skill helps students manipulate formulas, which is essential in mathematics, science, and real-world problem-solving.

Instruction will focus on understanding the structure of literal equations, applying properties of equality step by step, and checking solutions by substitution. Students will also explore real-world applications, such as solving formulas for distance, area, perimeter, or physics-related quantities.

Learning Objectives

- Solve literal equations for a specific variable.
- Apply inverse operations systematically to isolate the desired variable.
- Check solutions by substituting back into the original equation.
- Use literal equations to model and solve real-world problems.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ✚

Topic: Multi-step Equations

Duration: Ongoing

Topic Overview

Multi-step equations require students to apply multiple algebraic operations in sequence to isolate the variable and solve for unknown values. In this topic, students will extend their skills from one- and two-step equations to more complex problems involving the distributive property, combining like terms, and working with variables on both sides of the equation.

Instruction will emphasize a systematic approach to solving equations, including simplifying expressions, maintaining equality, and checking solutions for accuracy. Students will also practice applying these skills to real-world scenarios, such as financial calculations, measurements, and other practical problems.

Learning Objectives

- Solve equations that require multiple steps, including distribution and combining like terms.
- Solve equations with variables on both sides.
- Check solutions by substituting values back into the original equation.
- Apply multi-step equations to model and solve real-world problems.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ✚

Topic: Compound Inequalities

Duration: Ongoing

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Topic Overview

Compound inequalities involve two or more inequalities joined by the words “and” or “or,” requiring students to determine solution sets that satisfy multiple conditions simultaneously. In this topic, students will learn how to solve and graph compound inequalities on a number line, interpret their solutions, and apply them in real-world contexts.

Instruction will emphasize understanding the differences between “and” (intersection) and “or” (union) situations, as well as using inverse operations and the properties of inequalities to isolate variables. Students will also practice checking solutions and interpreting them in practical problem scenarios, such as ranges of acceptable values or limits on quantities.

Learning Objectives

Solve compound inequalities using “and” and “or” logic.

Graph solution sets accurately on a number line.

Apply inverse operations and properties of inequalities to maintain correct solutions.

Interpret solutions in real-world contexts and check for accuracy.

Priority Learning Objective =★

Learning Objectives linked to Essential Standard =✚

Unit: Unit 3: Functions and Relations

Duration: Ongoing

Unit Description

This unit focuses on the concept of functions as a cornerstone of algebra. Students will review the coordinate plane, identify domain and range, and use the vertical line test to distinguish functions from other relations. They will practice writing equations as functions, using function notation, and finding zeros of functions. Real-world graphs will provide opportunities for students to interpret and analyze relationships. By the end of the unit, students will have a strong foundation in recognizing, representing, and applying functions in multiple forms.

Topic: Coordinate Plane and Graph Review

Duration: Ongoing

Topic Overview

The coordinate plane provides a foundation for understanding algebraic relationships and graphing functions. In this topic, students will review the Cartesian coordinate system, including the x- and y-axes, quadrants, and the plotting of points. They will also practice graphing lines and simple relationships to reinforce their understanding of spatial representation in mathematics.

Instruction will emphasize interpreting coordinates, identifying patterns, and connecting numerical relationships to visual representations. Students will also explore how graphs can model real-world situations, such as movement, trends, or comparisons.

Learning Objectives

Identify and label the x- and y-axes and the four quadrants of the coordinate plane.

Plot points accurately using ordered pairs.

Graph simple linear relationships and recognize patterns.

Interpret graphs in real-world contexts and relate them to equations or expressions.

Priority Learning Objective =★

Learning Objectives linked to Essential Standard =✚

Topic: Domain/Range and Vertical Line Test

Duration: Ongoing

Topic Overview

Understanding the concepts of domain and range is essential for describing the inputs and outputs of a function. In this topic, students will learn how to identify the domain (all possible x-values) and range (all possible y-values) from tables, graphs, and equations. They will also use the Vertical Line Test to determine whether a relation is a function.

Instruction will emphasize analyzing graphs and equations to determine allowable inputs and corresponding outputs, as well as interpreting the results in real-world contexts. Students will also explore how the Vertical Line Test provides a visual method for distinguishing functions from general relations.

Learning Objectives

Identify the domain and range from tables, graphs, and equations.

Use the Vertical Line Test to determine whether a relation is a function.

Explain the relationship between input and output values in a function.

Apply these concepts to model and analyze real-world situations.

Priority Learning Objective =★

Learning Objectives linked to Essential Standard =✚

Topic: Equations as Functions Dictionary

Duration: Ongoing

Topic Overview

In this topic, students explore how equations can be represented as functions, emphasizing the relationship between input (independent variable) and output (dependent variable). Using a “dictionary” or table format, students will list input-output pairs to visualize and understand how a function maps each input to a single output.

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Instruction will focus on creating and interpreting tables of values, recognizing patterns, and connecting these representations to graphs and equations. Students will also analyze how changes in inputs affect outputs and relate these observations to real-world situations.

Learning Objectives

- Represent functions as tables of input-output pairs.
- Identify patterns and relationships in the data.
- Connect the table representation to corresponding equations and graphs.
- Apply function tables to model real-world scenarios.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Topic: Equations as Functions

Duration: Ongoing

Topic Overview

In this topic, students deepen their understanding of functions by examining equations as representations of relationships between variables. They will explore how each input (x-value) corresponds to exactly one output (y-value) and how these relationships can be expressed in multiple forms—equations, tables, and graphs.

Instruction will emphasize interpreting and analyzing equations to determine whether they represent functions, identifying patterns in outputs, and connecting algebraic rules to visual representations. Students will also apply these skills to real-world situations where one quantity depends on another.

Learning Objectives

- Determine whether an equation represents a function.
- Represent functions using equations, tables, and graphs.
- Analyze input-output relationships and identify patterns.
- Apply function concepts to model real-world problems.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Topic: Function Notation

Duration: Ongoing

Topic Overview

Function notation provides a concise way to represent functions and their values. In this topic, students will learn how to use notation such as $f(x)$ to indicate the output of a function for a given input. They will practice evaluating functions, interpreting the meaning of $f(x)$ in context, and connecting the notation to tables, equations, and graphs.

Instruction will emphasize understanding that $f(x)$ represents a value, not a multiplication, and interpreting inputs and outputs in real-world scenarios. Students will also explore how function notation allows for clearer communication of rules and relationships.

Learning Objectives

- Understand and correctly use function notation $f(x)$.
- Evaluate functions for given input values.
- Represent functions in multiple forms (equations, tables, and graphs).
- Apply function notation to model and solve real-world problems.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Topic: Zeros of Functions

Duration: Ongoing

Topic Overview

The zeros of a function are the input values (x-values) that produce an output of zero. In this topic, students will learn how to identify and interpret zeros from tables, graphs, and equations. Understanding zeros is essential for analyzing the behavior of functions and solving equations.

Instruction will emphasize recognizing patterns that lead to zeros, connecting them to x-intercepts on graphs, and interpreting their meaning in real-world contexts, such as break-even points, thresholds, or critical values. Students will also explore how finding zeros is a key step in solving linear and quadratic equations.

Learning Objectives

- Identify zeros of functions from graphs, tables, and equations.
- Interpret zeros in the context of real-world problems.
- Connect zeros to x-intercepts and solutions of equations.
- Apply understanding of zeros to analyze and solve function-related problems.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Topic: Real World Graphs

Duration: Ongoing

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Topic Overview

Graphing real-world situations allows students to visualize and analyze relationships between variables. In this topic, students will interpret and create graphs that model practical scenarios, such as distance versus time, cost versus quantity, or population trends. They will connect the graphical representation to the underlying equation and understand how changes in variables affect the graph.

Instruction will emphasize interpreting slopes, intercepts, and trends in context, as well as selecting appropriate scales and labels. Students will also explore how graphs can communicate patterns and predictions clearly and accurately.

Learning Objectives

- Interpret real-world data using graphs.
- Connect graphs to equations, tables, and functional relationships.
- Analyze slope, intercepts, and trends in context.
- Create accurate graphs to model real-world scenarios.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Topic: Relations and Functions

Duration: Ongoing

Topic Overview

Relations and functions are foundational concepts that describe how variables are connected. In this topic, students will explore the difference between general relations and functions, understand how each input corresponds to exactly one output in a function, and represent these relationships using tables, graphs, and equations.

Instruction will emphasize analyzing patterns, identifying functions, and interpreting the meaning of inputs and outputs in real-world contexts. Students will also practice mapping relations and using multiple representations to communicate their understanding effectively.

Learning Objectives

- Distinguish between relations and functions.
- Represent functions using tables, graphs, and equations.
- Analyze input-output relationships and recognize patterns.
- Apply function concepts to model real-world problems.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Unit: Unit 4: Linear Equations

Duration: Ongoing

Unit Description

Students will explore linear relationships and their representations in this unit. They will learn to calculate slope from graphs, write equations in slope-intercept, point-slope, and standard form, and interpret x- and y-intercepts. Instruction will also focus on identifying parallel and perpendicular lines, graphing vertical and horizontal lines, and analyzing rates of change. Through modeling linear functions and examining their characteristics, students will connect algebraic rules to graphical behavior and apply these skills to real-world problem-solving.

Topic: Slope from Graphs

Duration: Ongoing

Topic Overview

Slope measures the steepness and direction of a line and is a fundamental concept in understanding linear relationships. In this topic, students will learn how to calculate slope from a graph by analyzing the rise (vertical change) over run (horizontal change) between two points. They will also interpret the meaning of positive, negative, zero, and undefined slopes in context.

Instruction will emphasize connecting the graphical representation of slope to real-world situations, such as speed, rate of change, or trends over time. Students will practice identifying slope visually, calculating it accurately, and using it to describe linear behavior.

Learning Objectives

- Calculate slope from a graph using rise over run.
- Interpret positive, negative, zero, and undefined slopes.
- Connect slope to real-world contexts, such as rates of change.
- Analyze and describe the behavior of linear relationships using slope.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Topic: Slope Intercept and Standard Form

Duration: Ongoing

Topic Overview

Linear equations can be represented in multiple forms, each providing different insights about the line. In this topic, students will explore slope-intercept form ($y = mx + b$) and standard form ($Ax + By = C$) to describe, analyze, and graph lines. They will learn how to identify slope and y-intercept from slope-intercept form and how to rewrite equations between the two forms.

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Instruction will emphasize understanding how each form conveys information about the line, including slope, intercepts, and general structure. Students will also practice applying these forms to model real-world problems, such as motion, cost, or growth scenarios.

Learning Objectives

- Identify slope and y-intercept from slope-intercept form.
- Rewrite linear equations between slope-intercept and standard form.
- Interpret the meaning of equation components in context.
- Apply these forms to model and solve real-world situations involving linear relationships.

Priority Learning Objective = ☆

Learning Objectives linked to Essential Standard = ⊕

Topic: X and Y Intercepts

Duration: Ongoing

Topic Overview

X- and y-intercepts are the points where a line crosses the x-axis and y-axis, providing key information about linear relationships. In this topic, students will learn how to identify and calculate intercepts from equations, tables, and graphs. They will also interpret the meaning of intercepts in real-world contexts, such as starting values or thresholds.

Instruction will emphasize connecting intercepts to the graphical representation of a line, using them to graph linear equations efficiently, and applying them to solve real-world problems. Students will practice finding intercepts for lines in slope-intercept and standard form.

Learning Objectives

- Identify x- and y-intercepts from graphs, tables, and equations.
- Calculate intercepts using algebraic methods.
- Interpret the meaning of intercepts in context.
- Use intercepts to graph linear equations and model real-world situations.

Priority Learning Objective = ☆

Learning Objectives linked to Essential Standard = ⊕

Topic: Vertical and Horizontal Lines

Duration: Ongoing

Topic Overview

Vertical and horizontal lines are special types of linear equations that have unique properties on the coordinate plane. In this topic, students will learn that horizontal lines have a slope of zero and a constant y-value, while vertical lines have an undefined slope and a constant x-value.

Instruction will emphasize graphing these lines, identifying their equations, and understanding their characteristics in real-world contexts, such as constant rates or fixed positions. Students will also explore how these lines interact with other lines in terms of parallelism and perpendicularity.

Learning Objectives

- Identify and graph vertical and horizontal lines.
- Write equations for vertical and horizontal lines.
- Explain the slope characteristics of these lines.
- Apply the concepts to model real-world situations with constant or fixed values.

Priority Learning Objective = ☆

Learning Objectives linked to Essential Standard = ⊕

Topic: Point Slope Formula

Duration: Ongoing

Topic Overview

The point-slope formula provides a method to write the equation of a line when a point on the line and its slope are known. In this topic, students will learn how to use the formula

$$y - y_1 = m(x - x_1)$$

to represent linear relationships accurately and efficiently.

Instruction will emphasize identifying a point and the slope from graphs or given information, substituting correctly into the formula, and simplifying the equation into slope-intercept or standard form when needed. Students will also apply the formula to real-world problems, such as modeling rates of change and predicting outcomes.

Learning Objectives

- Write the equation of a line using the point-slope formula.
- Identify points and slope from graphs or data.
- Convert equations from point-slope form to slope-intercept or standard form.
- Apply the point-slope formula to model and solve real-world problems.

Priority Learning Objective = ☆

Learning Objectives linked to Essential Standard = ⊕

Topic: Parallel and Perpendicular Lines**Topic Overview**

Understanding parallel and perpendicular lines is essential for analyzing relationships between linear equations. In this topic, students will learn that parallel lines have the same slope and never intersect, while perpendicular lines have slopes that are negative reciprocals of each other and intersect at a right angle.

Instruction will emphasize identifying parallel and perpendicular lines from equations and graphs, writing equations for lines with specified relationships, and applying these concepts to solve real-world problems. Students will also explore how these relationships appear in geometry, engineering, and everyday contexts.

Learning Objectives

- Identify parallel and perpendicular lines from graphs and equations.
- Determine slopes of parallel and perpendicular lines.
- Write equations of lines that are parallel or perpendicular to a given line.
- Apply these concepts to model and solve real-world scenarios involving linear relationships.

Priority Learning Objective =★

Learning Objectives linked to Essential Standard =✚

Topic: Point Slope with 2 Points**Duration:** Ongoing**Topic Overview**

When two points on a line are known, students can use the point-slope formula to write the equation of the line. In this topic, students will first calculate the slope from the two points and then apply the point-slope formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

to determine the line's equation.

Instruction will emphasize accurately finding slope, choosing one of the points for substitution, and simplifying the equation into slope-intercept or standard form. Students will also practice interpreting the meaning of the slope and equation in real-world situations, such as rates of change and trends.

Learning Objectives

- Calculate the slope from two points.
- Write the equation of a line using the point-slope formula.
- Convert the equation to slope-intercept or standard form.
- Apply the process to solve real-world problems involving linear relationships.

Priority Learning Objective =★

Learning Objectives linked to Essential Standard =✚

Topic: Linear Functions**Duration:** Ongoing**Topic Overview**

Linear functions represent relationships in which the rate of change is constant, producing a straight-line graph. In this topic, students will explore the characteristics of linear functions, including slope, y-intercept, and the general behavior of the function. They will also learn to write, interpret, and graph linear functions from equations, tables, or verbal descriptions.

Instruction will emphasize connecting the algebraic, graphical, and tabular representations of linear functions, identifying patterns, and interpreting slope and intercepts in context. Students will also apply linear functions to model real-world situations, such as speed, cost, or growth.

Learning Objectives

- Identify and describe the characteristics of linear functions.
- Represent linear functions using equations, tables, and graphs.
- Interpret slope and intercepts in real-world contexts.
- Apply linear functions to model and solve practical problems.

Priority Learning Objective =★

Learning Objectives linked to Essential Standard =✚

Topic: Characteristics of Linear Functions**Duration:** Ongoing**Topic Overview**

Linear functions have specific features that help describe and analyze their behavior. In this topic, students will explore key characteristics of linear functions, including slope, y-intercept, x-intercept, domain, range, and rate of change. They will learn how these features are represented in graphs, tables, and equations and how they relate to real-world situations.

Instruction will emphasize identifying and interpreting these characteristics, comparing different linear functions, and using them to analyze

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trends or solve problems. Students will also practice recognizing linearity and predicting outcomes based on the function's properties.

Learning Objectives

- Identify slope, y-intercept, x-intercept, domain, and range of a linear function.
- Interpret the meaning of these characteristics in context.
- Interpret the meaning of these characteristics in context.
- Apply the characteristics to solve real-world problems and make predictions.

Priority Learning Objective = ☆

Learning Objectives linked to Essential Standard = ⊕

Topic: Linear Equations in Standard Form

Duration: Ongoing

Topic Overview

Linear equations can be written in standard form ($ax + by = c$), which provides a structured way to analyze and work with lines. In this topic, students will learn how to write, interpret, and manipulate linear equations in standard form, including identifying coefficients, constants, and intercepts.

Instruction will emphasize converting between slope-intercept and standard form, graphing lines using intercepts, and applying standard form to solve real-world problems. Students will also explore how the standard form can simplify solving systems of linear equations.

Learning Objectives

- Write linear equations in standard form.
- Identify coefficients, constants, and intercepts from standard form equations.
- Convert between standard form and slope-intercept form.
- Apply standard form equations to model and solve real-world problems.

Priority Learning Objective = ☆

Learning Objectives linked to Essential Standard = ⊕

Topic: Linear Models and Point Slope

Duration: Ongoing

Topic Overview

Linear models are equations that describe real-world relationships with a constant rate of change. In this topic, students will learn how to use the point-slope form of a line ($y - y_1 = m(x - x_1)$) to create linear models from data points and apply them to solve problems.

Instruction will emphasize identifying slope from data, selecting appropriate points, writing equations in point-slope form, and interpreting the meaning of slope and intercept in context. Students will also practice using linear models to make predictions and analyze trends in real-world scenarios.

Learning Objectives

- Create linear models using the point-slope form of an equation.
- Interpret slope and intercepts in the context of data and real-world situations.
- Use linear models to make predictions and solve problems.
- Connect point-slope equations to graphs, tables, and real-life applications.

Priority Learning Objective = ☆

Learning Objectives linked to Essential Standard = ⊕

Topic: Slopes of Lines and Rates of Change

Duration: Ongoing

Topic Overview

The slope of a line represents the rate of change between two variables, providing insight into how one quantity changes in relation to another. In this topic, students will learn to calculate slopes from graphs, tables, and equations, and interpret slope as a rate of change in real-world contexts such as speed, cost, or growth.

Instruction will emphasize connecting slope to linear equations, identifying positive, negative, zero, and undefined slopes, and analyzing how changes in slope affect the behavior of a line. Students will also explore the practical applications of rates of change in everyday scenarios.

Learning Objectives

- Calculate slope from graphs, tables, and equations.
- Interpret slope as a rate of change in context.
- Identify positive, negative, zero, and undefined slopes.
- Apply the concept of slope to analyze and model real-world situations.

Priority Learning Objective = ☆

Learning Objectives linked to Essential Standard = ⊕

Unit: Unit 5: Systems of Equations

Duration: Ongoing

Unit Description

This unit introduces students to solving systems of linear equations using multiple strategies, including graphing, substitution, and elimination. Students will learn to interpret solutions in terms of context, identifying when systems have one solution, infinitely many solutions, or no

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solution. Applications will emphasize problem-solving with real-world scenarios where multiple constraints must be considered simultaneously, helping students see how algebra models decision-making and optimization.

Unit: Unit 7: Polynomials

Duration: Ongoing

Unit Description

Students will expand their algebraic skills by working with polynomials in this unit. They will classify polynomials by degree and number of terms, and perform operations including addition, subtraction, multiplication, and factoring. Special focus will be given to multiplying binomials and trinomials, as well as recognizing special products. Factoring will be applied both as a simplification strategy and as a tool for solving equations. This unit provides a critical bridge between linear equations and the study of quadratic and higher-order functions.

Topic: Classifying Polynomials

Duration: Ongoing

Topic Overview

Polynomials are expressions made up of variables and coefficients combined using addition, subtraction, and multiplication. In this topic, students will learn how to identify and classify polynomials based on degree (the highest exponent) and the number of terms (monomial, binomial, trinomial, or polynomial).

Instruction will emphasize recognizing the structure of polynomials, understanding terminology, and connecting these classifications to algebraic operations and problem-solving. Students will also explore real-world contexts where polynomials can be used to model quantities, areas, and other relationships.

Learning Objectives

Identify polynomials and their components, including terms, coefficients, and degree.

Classify polynomials by the number of terms and degree.

Understand the language and notation of polynomials.

Apply classification skills to prepare for addition, subtraction, multiplication, and factoring of polynomials.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Add and Subtract Polynomials

Duration: Ongoing

Topic Overview

Adding and subtracting polynomials involves combining like terms to simplify expressions. In this topic, students will practice identifying like terms and performing operations to create simplified polynomial expressions.

Instruction will emphasize aligning terms by degree, using proper notation, and understanding how addition and subtraction of polynomials relate to combining quantities in real-world contexts. Students will also explore how these skills prepare them for more complex operations, such as multiplication and factoring.

Learning Objectives

Identify like terms in polynomial expressions.

Add and subtract polynomials accurately.

Simplify polynomial expressions using proper notation.

Apply these operations to solve real-world problems modeled by polynomials.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Factoring and Polynomial Review

Duration: Ongoing

Topic Overview

Factoring is the process of breaking a polynomial into a product of simpler polynomials or factors. In this topic, students will review key polynomial concepts and practice factoring techniques, including factoring out the greatest common factor (GCF) and factoring simple trinomials.

Instruction will emphasize recognizing patterns in polynomials, applying factoring strategies step by step, and connecting factoring to solving polynomial equations. Students will also explore real-world applications where factoring simplifies problem-solving or models relationships.

Learning Objectives

Review and reinforce polynomial terminology and operations.

Factor polynomials using the greatest common factor.

Factor simple trinomials and apply factoring strategies.

Use factoring to solve polynomial equations and model real-world situations.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Multiplying Monomials and Polynomials

Duration: Ongoing

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Topic Overview

Multiplication of monomials and polynomials is a fundamental algebraic skill that allows students to expand expressions and model more complex relationships. In this topic, students will learn to multiply monomials by monomials, monomials by polynomials, and polynomials by polynomials using the distributive property and combining like terms.

Instruction will emphasize applying the distributive property systematically, organizing work clearly, and simplifying expressions accurately. Students will also explore applications in real-world contexts, such as area problems, volume calculations, and modeling situations with multiple factors.

Learning Objectives

- Multiply monomials and polynomials accurately.
- Apply the distributive property to expand expressions.
- Combine like terms to simplify the resulting polynomial.
- Use multiplication of polynomials to model and solve practical problems.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Multiplying Binomials and Trinomials

Duration: Ongoing

Topic Overview

Multiplying binomials and trinomials allows students to expand more complex polynomial expressions and prepare for factoring and solving equations. In this topic, students will practice using methods such as the distributive property, area model, and FOIL (First, Outer, Inner, Last) to multiply binomials, and extend these strategies to multiply trinomials.

Instruction will emphasize careful organization of terms, combining like terms, and verifying results for accuracy. Students will also explore real-world applications where expanding polynomials models scenarios such as area, revenue, or multi-step calculations.

Learning Objectives

- Multiply binomials using FOIL, the distributive property, and area models.
- Multiply trinomials and simplify the resulting polynomial expressions.
- Combine like terms accurately and maintain proper notation.
- Apply multiplication of polynomials to solve real-world problems.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Special Polynomial Product

Duration: Ongoing

Topic Overview

Certain polynomial products follow predictable patterns that allow for faster multiplication. In this topic, students will learn to recognize and apply special product formulas, including:

The square of a binomial: $(+)^2$ and $(-)^2$

The product of a sum and difference: $(+)(-)$

Instruction will emphasize identifying opportunities to use these shortcuts, applying the formulas accurately, and simplifying the resulting expressions. Students will also explore applications of special products in problem-solving and real-world contexts, such as area calculations and algebraic modeling.

Learning Objectives

- Recognize and apply the special product formulas correctly.
- Simplify expressions resulting from these products.
- Apply special products to solve algebraic problems efficiently.
- Use these techniques to model and solve real-world situations.

Priority Learning Objective = ☆
Learning Objectives linked to Essential Standard = ⊕

Topic: Polynomial Review

Duration: Ongoing

Topic Overview

This topic provides students with a comprehensive review of polynomials, reinforcing all key skills learned in the unit. Students will revisit identifying and classifying polynomials, adding, subtracting, and multiplying polynomials, applying special products, and factoring.

Instruction will emphasize integrating multiple operations and strategies, simplifying complex polynomial expressions, and solving related equations. Students will also work on applying these skills to real-world problems, ensuring they can use polynomials confidently in various contexts.

Learning Objectives

- Identify, classify, and describe polynomials.

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Required Course

Add, subtract, and multiply polynomials accurately.
Apply factoring and special product strategies to simplify expressions.
Use polynomials to model and solve real-world problems.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Unit: Unit 8: Quadratics

Duration: Ongoing

Unit Description

The final major unit of Algebra 1 centers on quadratic functions and equations. Students will learn to solve quadratic equations by graphing, factoring, using square roots, and applying the quadratic formula. They will analyze the properties of quadratic functions, including vertex, axis of symmetry, and discriminant. Students will also convert between standard, vertex, and factored forms of quadratic equations. Emphasis will be placed on interpreting quadratic models in real-world situations, such as projectile motion and area optimization. By the end of this unit, students will have a comprehensive understanding of quadratic relationships and their applications.

Topic: Solving Quadratic Equations by Graphing

Duration: Ongoing

Topic Overview

Quadratic equations describe relationships where the variable is squared, producing a parabolic graph. In this topic, students will learn to solve quadratic equations by graphing, identifying the points where the parabola intersects the x-axis (the zeros or roots of the equation).

Instruction will emphasize interpreting the graph of a quadratic function, estimating solutions visually, and understanding the connection between the graph and the algebraic equation. Students will also explore real-world applications where graphing provides insights, such as projectile motion, area problems, or profit modeling.

Learning Objectives

Graph quadratic functions accurately.
Identify the zeros of a quadratic equation from the graph.
Connect the graph to the corresponding equation.
Apply graphing techniques to solve real-world problems involving quadratics.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Topic: Solve Quadratic Equations by Factoring ($a=1$)

Duration: Ongoing

Topic Overview

In this topic, students will learn to solve quadratic equations in the form $2x^2 + bx + c = 0$ where the leading coefficient $=1$. Factoring allows students to rewrite the equation as a product of two binomials and then use the Zero Product Property to find the solutions.

Instruction will emphasize identifying factor pairs of the constant term that sum to $-b$, setting each factor equal to zero, and solving for the variable. Students will also practice checking solutions by substitution and applying factoring to real-world problems modeled by quadratic equations.

Learning Objectives

Factor simple quadratics where $a=1$.
Apply the Zero Product Property to solve equations.
Check solutions for accuracy.
Use factoring to model and solve practical problems involving quadratics.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

Topic: Solving Quadratics by Factoring ($a=1$) cont...

Duration: Ongoing

Topic Overview

In this topic, students will learn to solve quadratic equations in the form $2x^2 + bx + c = 0$ where the leading coefficient $=1$. Factoring allows students to rewrite the equation as a product of two binomials and then use the Zero Product Property to find the solutions.

Instruction will emphasize identifying factor pairs of the constant term that sum to $-b$, setting each factor equal to zero, and solving for the variable. Students will also practice checking solutions by substitution and applying factoring to real-world problems modeled by quadratic equations.

Learning Objectives

Factor simple quadratics where $a=1$.
Apply the Zero Product Property to solve equations.
Check solutions for accuracy.
Use factoring to model and solve practical problems involving quadratics.

Priority Learning Objective =★
Learning Objectives linked to Essential Standard =✚

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Topic: Solve Quadratics by Factoring (a is not 0)

Duration: Ongoing

Topic Overview

Not all quadratics have a leading coefficient of 1. In this topic, students will extend their factoring skills to solve equations of the form $ax^2 + bx + c = 0$ where $a \neq 1$. Students will explore strategies such as factoring by grouping and the "ac method" to rewrite quadratics into factorable forms.

Instruction will focus on recognizing when factoring is possible, applying the Zero Product Property to find solutions, and verifying solutions by substitution. Emphasis will also be placed on accuracy and organization, as these equations often involve larger numbers and more steps.

Learning Objectives

Factor quadratics where $a \neq 1$ using grouping or the ac method.
Solve quadratic equations by setting each factor equal to zero.
Verify solutions through substitution into the original equation.
Apply these methods to model and solve real-world quadratic problems.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ⊕

Topic: Solve Quadratics by Square Roots

Duration: Ongoing

Topic Overview

Some quadratic equations can be solved more directly by isolating the squared variable and taking the square root of both sides. In this topic, students will focus on equations in the form $x^2 = k$ and related variations, applying the principle that every nonzero square root has both a positive and a negative solution.

Instruction will emphasize isolating the squared term, applying square root properties, and simplifying radical expressions when necessary. Students will also practice checking solutions, especially when equations involve extraneous roots. Real-world applications, such as area and geometry problems, will be used to show the usefulness of this method.

Learning Objectives

Solve quadratic equations of the form $x^2 = k$ by taking square roots.
Apply both the positive and negative square roots in solutions.
Simplify radicals and check for extraneous solutions.
Use square root solving techniques to model and solve real-world problems.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ⊕

Topic: Solve Quadratics by $ax^2 + bx + c$

Duration: Ongoing

Topic Overview

Quadratic equations often appear in the standard form $ax^2 + bx + c = 0$, where a , b , and c are constants. In this topic, students will explore different strategies for solving such equations, depending on the values of a , b , and c . Building on earlier methods (factoring and square roots), students will recognize when factoring is efficient, when completing the square is useful, and when the quadratic formula is the most reliable tool.

Instruction will emphasize selecting the most appropriate solving method, systematically applying it, and interpreting the results in mathematical and real-world contexts. Students will also analyze the number and type of solutions (real vs. complex) based on the discriminant.

Learning Objectives

Solve quadratic equations in standard form using factoring, square roots, completing the square, or the quadratic formula.
Determine which solving method is most efficient for a given equation.
Use the discriminant to predict the number and type of solutions.
Apply quadratic solving methods to model and solve real-world situations such as projectile motion and area problems.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ⊕

Topic: Properties of Quadratic Equations

Duration: Ongoing

Topic Overview

Quadratic equations have distinctive properties that describe their graphs and solutions. In this topic, students will explore key features of quadratic functions, including the vertex, axis of symmetry, direction of opening, maximum or minimum values, and zeros (x-intercepts). Understanding these properties helps students analyze the behavior of quadratic functions both algebraically and graphically.

Instruction will emphasize connecting equations, tables, and graphs, interpreting real-world implications, and using properties to solve problems efficiently. Students will also investigate how changes in coefficients affect the shape and position of the parabola.

Learning Objectives

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Identify and describe the vertex, axis of symmetry, direction of opening, and zeros of a quadratic function.
Analyze how coefficients a , b , and c affect the graph.
Connect algebraic equations to graphical representations.
Apply these properties to model and solve real-world problems.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ⊕

Topic: Solve Simple Quadratic Equations

Duration: Ongoing

Topic Overview

Some quadratic equations can be solved using straightforward methods that require minimal manipulation. In this topic, students will focus on simple quadratic equations, such as those that can be solved by factoring, taking square roots, or isolating the variable.

Instruction will emphasize recognizing the simplest approach for each equation, applying the chosen method accurately, and verifying solutions. Students will also explore real-world applications where simple quadratics model problems like area, motion, or growth.

Learning Objectives

Identify simple quadratic equations and select an appropriate solving method.
Solve quadratic equations using factoring or square roots.
Check solutions for accuracy.
Apply simple quadratic solving techniques to real-world contexts.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ⊕

Topic: Quadratic Roots and the Discriminant

Duration: Ongoing

Topic Overview

The discriminant of a quadratic equation provides valuable information about the nature and number of its solutions without solving the equation completely. In this topic, students will learn how to calculate the discriminant from the standard form $ax^2 + bx + c = 0$ using the formula

$$b^2 - 4ac$$

and interpret its value to determine whether the quadratic has two real solutions, one real solution, or two complex solutions.

Instruction will emphasize connecting the discriminant to the graph of the quadratic function, understanding the relationship between roots and x-intercepts, and applying the discriminant to predict solution types in real-world problems.

Learning Objectives

Calculate the discriminant of a quadratic equation.
Determine the number and type of roots based on the discriminant.
Connect discriminant values to the graph of the quadratic function.
Apply the discriminant to analyze and solve real-world quadratic problems.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ⊕

Topic: Quadratic Formula

Duration: Ongoing

Topic Overview

The quadratic formula provides a universal method for solving any quadratic equation in standard form $ax^2 + bx + c = 0$. In this topic, students will learn the formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ and apply it to find real or complex solutions for quadratic equations.

Instruction will emphasize identifying the coefficients a , b , and c , calculating the discriminant, simplifying radicals, and interpreting the results in context. Students will also explore real-world applications, such as projectile motion, area problems, and financial modeling, where solving quadratics is necessary.

Learning Objectives

Apply the quadratic formula accurately to solve any quadratic equation.
Calculate and interpret the discriminant to determine the number and type of solutions.
Simplify radical expressions and write solutions in simplest form.
Apply the quadratic formula to model and solve real-world problems.

Priority Learning Objective = ★
Learning Objectives linked to Essential Standard = ⊕

Topic: Vertex Form

Duration: Ongoing

Topic: Converting Between Forms

Duration: Ongoing

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Required Course

