

## Middle School Math Course 2

This course covers the topics shown below, **new topics** have been highlighted.  
Students navigate learning paths based on their level of readiness.  
Institutional users may customize the scope and sequence to meet curricular needs.

Curriculum (420 topics + 894 additional topics)

- Whole Numbers and Integers (78 topics)
  - Addition and Subtraction with Whole Numbers (8 topics)
    - Adding 2-digit numbers with regrouping a hundred
    - Adding 3 or 4 numbers with two-digits with regrouping
    - Adding 3-digit numbers with regrouping
    - Subtraction of 2-digit numbers with regrouping
    - Subtraction with multiple regrouping steps involving 3-digit numbers
    - Subtraction and regrouping with zeros
    - Describing an increasing or decreasing pattern from a table of values
    - Perimeter of a square or a rectangle
  - Multiplication and Division with Whole Numbers (18 topics)
    - Multiplying 2-digit and 1-digit numbers with regrouping: Problem type 2
    - Multiplying multi-digit and 1-digit numbers with regrouping
    - Area of a rectangle with two-digit by one-digit side lengths
    - Introduction to multiplication of large numbers
    - Multiplication of large numbers
    - Multiples: Problem type 1
    - Multiples: Problem type 2
    - Division of whole numbers given in fractional form
    - Division involving zero
    - Division with regrouping: 1-digit divisor, 2-digit dividend
    - Quotient with remainder: 1-digit divisor, 2-digit dividend
    - Whole number division: 2-digit by 2-digit, no remainder
    - Word problem with multiplication or division of whole numbers
    - Word problem with multiplication and addition or subtraction of whole numbers
    - Word problem on unit rates associated with ratios of whole numbers: Whole number answers
    - Division with regrouping: 1-digit divisor, 3-digit or 4-digit dividend
    - Whole number division: 3-digit by 2-digit, no remainder
    - Division with no remainder and a two-digit divisor: Problem type 2
  - Ordering and Estimation (2 topics)
    - Introduction to inequalities
    - Estimating a product
  - Exponents and Order of Operations (5 topics)
    - Introduction to exponents
    - Introduction to parentheses
    - Introduction to order of operations
    - Order of operations with whole numbers
    - Order of operations with whole numbers and exponents: Basic
  - Prime Numbers, Factors, and Multiples (2 topics)
    - Factors
    - Greatest common factor of 2 numbers
  - Plotting and Comparing Integers (5 topics)
    - Plotting integers on a number line
    - Plotting opposite integers on a number line
    - Ordering integers
    - Writing a signed number for a real-world situation
    - Absolute value of a number
  - Addition and Subtraction with Integers (17 topics)
    - Using integer chips to add integers
    - Using a number line to add integers
    - Integer addition: Problem type 1
    - Integer addition: Problem type 2
    - Identifying a sum as a point located a given distance from another point
    - Identifying relative change when combining two quantities
    - Using integer chips to subtract integers

- Using a number line to subtract integers
- Understanding that subtracting an integer is the same as adding its additive inverse
- Integer subtraction: Problem type 1
- Integer subtraction: Problem type 2
- Integer subtraction: Problem type 3
- Addition and subtraction with 3 integers
- Word problem with addition or subtraction of integers
- Operations with absolute value: Problem type 1
- Computing the distance between two integers on a number line
- Computing and understanding distances between integers on a number line
- Multiplication and Division with Integers (5 topics)
  - Integer multiplication and division
  - Multiplication of 3 or 4 integers
  - Word problem with multiplication or division of integers
  - Exponents and integers: Problem type 1
  - Order of operations with integers
- Evaluating and Writing Expressions (7 topics)
  - Evaluating an algebraic expression: Whole numbers with two operations
  - Evaluating a formula
  - Evaluating an algebraic expression: Whole numbers with one operation and an exponent
  - Evaluating a linear expression: Integer multiplication with addition or subtraction
  - Writing a one-step expression for a real-world situation
  - Translating a phrase into a one-step expression
  - Translating a phrase into a two-step expression
- One-Step Equations (9 topics)
  - Identifying solutions to a one-step linear equation: Problem type 1
  - Identifying solutions to a one-step linear equation: Problem type 2
  - Additive property of equality with whole numbers
  - Additive property of equality with integers
  - Introduction to solving an equation with multiplication or division
  - Writing an equation and solving a multiplicative comparison word problem
  - Multiplicative property of equality with whole numbers
  - Multiplicative property of equality with integers
  - Translating a sentence into a one-step equation
- Fractions (40 topics)
  - Equivalent Fractions (6 topics)
    - Introduction to non-unit fractions
    - Conversions involving division in fractional form and whole numbers
    - Equivalent fractions
    - Introduction to simplifying a fraction
    - Simplifying a fraction
    - Identifying equivalent signed fractions
  - Plotting and Ordering Fractions (3 topics)
    - Plotting fractions using a number line
    - Comparing fractions with the same denominator
    - Comparing fractions by finding a common denominator
  - Mixed Numbers and Improper Fractions (4 topics)
    - Writing an improper fraction as a mixed number
    - Writing a mixed number as an improper fraction
    - Plotting mixed numbers on a number line
    - Plotting rational numbers on a number line
  - Addition and Subtraction with Fractions (8 topics)
    - Addition or subtraction of fractions with the same denominator and simplification
    - Word problem involving addition or subtraction of fractions with the same denominator
    - Finding the LCD of two fractions
    - Writing fractions with a common denominator to add or subtract
    - Addition or subtraction of fractions with different denominators
    - Signed fraction addition or subtraction: Basic
    - Signed fraction subtraction involving double negation
    - Word problem involving addition or subtraction of fractions with different denominators
  - Multiplication and Division with Fractions (15 topics)
    - Product of a unit fraction and a whole number
    - Product of a fraction and a whole number: Problem type 1
    - Product of a fraction and a whole number: Problem type 2
    - Word problem involving multiplying a fraction and a whole number

- Introduction to fraction multiplication
  - Fraction multiplication
  - Signed fraction multiplication: Basic
  - Word problem involving fractions and multiplication
  - The reciprocal of a number
  - Division involving a whole number and a unit fraction
  - Using a model to solve a word problem involving division by a unit fraction
  - Division involving a whole number and a fraction
  - Fraction division
  - Signed fraction division
  - Word problem involving fractions and division
- Multiplication and Division with Mixed Numbers (2 topics)
  - Multiplying a mixed number and a whole number: Problem type 1
  - Division with a mixed number and a whole number
- Exponents and Order of Operations (1 topics)
  - Exponents and fractions
- Expressions and One-Step Equations (5 topics)
  - Multiplicative property of equality with signed fractions
- Decimals (44 topics)
  - Place Value and Ordering (2 topics)
    - Decimal place value: Tenths and hundredths
    - Introduction to ordering decimals
  - Converting Decimals to Fractions (4 topics)
    - Converting a decimal to a proper fraction without simplifying: Basic
    - Converting a decimal to a proper fraction in simplest form: Basic
    - Converting a decimal to a mixed number and an improper fraction without simplifying
    - Converting a decimal to a mixed number and an improper fraction in simplest form: Basic
  - Addition and Subtraction (7 topics)
    - Decimal addition with 2 numbers
    - Decimal subtraction: Basic
    - Decimal subtraction: Advanced
    - Rounding decimals
    - Signed decimal addition and subtraction
    - Word problem with addition or subtraction of 2 decimals
    - Word problem with subtraction of a whole number and a decimal: Regrouping with zeros
  - Multiplication (9 topics)
    - Multiplication of a decimal by a power of ten
    - Multiplying a decimal less than 1 by a whole number
    - Multiplying a decimal by a whole number
    - Multiplying decimals less than 1: Problem type 1
    - Decimal multiplication: Problem type 1
    - Multiplication of a decimal by a power of 0.1
    - Signed decimal multiplication
    - Word problem with multiplication of a decimal and a whole number
    - Word problem with multiple decimal operations: Problem type 1
  - Division (4 topics)
    - Division of a decimal by a power of ten
    - Division of a decimal by a whole number
    - Word problem with division of a decimal and a whole number
    - Word problem with multiple decimal operations: Problem type 2
  - Converting Fractions to Decimals (7 topics)
    - Converting a fraction with a denominator of 10 or 100 to a decimal
    - Converting a proper fraction with a denominator of 2, 4, or 5 to a decimal
    - Converting a mixed number with a denominator of 2, 4, or 5 to a decimal
    - Converting a fraction to a terminating decimal: Basic
    - Converting a fraction to a terminating decimal: Advanced
    - Converting a fraction to a repeating decimal: Basic
    - Converting a mixed number to a terminating decimal: Basic
  - Venn Diagrams and Sets of Rational Numbers (2 topics)
    - Identifying numbers as integers or non-integers
    - Identifying rational decimal numbers
  - Exponents and Order of Operations (4 topics)

- Squaring decimal bases: Products greater than 0.1
- Exponents and decimals: Products less than 0.1
- Order of operations with decimals: Problem type 1
- Order of operations with decimals: Problem type 2
- Expressions and One-Step Equations (5 topics)
  - Evaluating a linear expression: Signed decimal addition and subtraction
  - Evaluating a linear expression: Signed decimal multiplication with addition or subtraction
  - Additive property of equality with decimals
  - Multiplicative property of equality with decimals
  - Writing and solving a one-step equation with decimals that models a real-world situation
- Ratios, Proportions, and Measurement (38 topics)
  - Ratios and Unit Rates (15 topics)
    - Using a tape diagram to model ratios
    - Using a tape diagram to solve a problem involving ratios
    - Using tables to compare ratios
    - Finding missing values in a table of equivalent ratios
    - Using a table of equivalent ratios to find a missing quantity in a ratio
    - Finding a unit price
    - Computing unit prices to find the better buy
    - Word problem on unit rates associated with ratios of whole numbers: Decimal answers
    - Word problem on unit rates associated with ratios of fractions
    - Word problem on unit rates associated with ratios of mixed numbers
    - Using a tape diagram to solve a problem on unit rates: Problem type 1
    - Solving a word problem on proportions using a unit rate
    - Using a tape diagram to solve a problem on unit rates: Problem type 2
    - Writing and using unit rates in context
    - Solving a one-step word problem using the formula  $d = rt$
  - Proportions (4 topics)
    - Solving a proportion of the form  $x/a = b/c$ : Basic
    - Solving a proportion of the form  $x/a = b/c$
    - Writing a proportion to solve a problem involving rates
    - Word problem on proportions: Problem type 1
  - Similar Figures (4 topics)
    - Identifying congruent shapes on a grid
    - Finding a missing side length given two similar triangles
    - Relationships about ratios within and between similar triangles
    - Similar polygons
  - Scale Factors and Scale Drawings (4 topics)
    - Finding lengths using scale models
    - Finding a scale factor: Same units
    - Using a scale drawing to find actual area
    - Reproducing a scale drawing at a different scale
  - U.S. Customary Units of Measurement (5 topics)
    - Using a double number line to convert U.S. Customary units with whole numbers
    - Using a double number line to convert U.S. Customary units with decimals
    - U.S. Customary length conversion with whole number values
    - U.S. Customary volume conversion with whole number values
    - U.S. Customary weight conversions with whole number values
  - Metric Units of Measurement (1 topics)
    - Finding a rate given a pictorial representation of a real-world situation
  - Time and Temperature (1 topics)
    - Time unit conversion with whole number values
  - Converting Between Systems and Dimensional Analysis (4 topics)
    - Writing and solving a proportion to convert between metric and U.S. Customary units
    - Converting between metric and U.S. Customary unit systems
    - U.S. Customary length conversions involving dimensional analysis
    - Converting between compound units: Basic
- Percents (36 topics)
  - Understanding Percents (2 topics)
    - Converting a fraction with a denominator of 100 to a percentage
    - Converting a percentage to a fraction with a denominator of 100

- Percents, Decimals, and Fractions (11 topics)
  - Introduction to converting a percentage to a decimal
  - Introduction to converting a decimal to a percentage
  - Converting between percentages and decimals
  - Converting a fraction to a percentage: Denominator of 4, 5, or 10
  - Finding benchmark fractions and percentages for a figure
  - Converting a fraction to a percentage: Denominator of 20, 25, or 50
  - Converting a fraction to a percentage in a real-world situation
  - Using a double number line to find a percentage
  - Writing a ratio as a percentage without a calculator
  - Finding the rate of a tax or commission
  - Making a reasonable inference based on proportion statistics
- Percent of a Number (10 topics)
  - Finding a percentage of a whole number
  - Finding a percentage of a whole number without a calculator: Basic
  - Finding a percentage of a whole number without a calculator: Advanced
  - Using a double number line to find the part or the whole in a percentage problem
  - Finding a percentage of a total amount: Real-world situations
  - Writing a proportion to solve a multi-step problem involving percentages
  - Finding a percentage of a total amount without a calculator: Sales tax, commission, discount
  - Estimating a tip without a calculator
  - Finding a percentage of a total amount in a circle graph
  - Making part-to-part and equivalence comparisons given a circle graph
- Percent Equations (2 topics)
  - Applying the percent equation: Problem type 1
  - Finding the total amount given the percentage of a partial amount
- Percent Increase and Decrease (6 topics)
  - Finding the final amount given the original amount and a percentage increase or decrease
  - Finding the sale price given the original price and percent discount
  - Finding the sale price without a calculator given the original price and percent discount
  - Finding the total cost including tax or markup
  - Finding the percentage increase or decrease: Basic
  - Finding the percentage increase or decrease: Advanced
- Interest (3 topics)
  - Finding simple interest without a calculator
  - Finding the interest and future value of a simple interest loan or investment
  - Introduction to compound interest
- Personal Financial Literacy (2 topics)
  - Calculating income tax
  - Calculating and comparing simple interest and compound interest
- Equations and Inequalities (47 topics)
  - The Distributive Property (4 topics)
    - Multiplying a constant and a linear monomial
    - Distributive property: Whole number coefficients
    - Distributive property: Fractional coefficients
    - Factoring a linear binomial
  - Simplifying Algebraic Expressions (7 topics)
    - Introduction to properties of addition
    - Combining like terms: Whole number coefficients
    - Using a number line to add opposite fractions and describing the result
    - Introduction to properties of multiplication
    - Combining like terms: Integer coefficients
    - Using distribution and combining like terms to simplify: Univariate
    - Identifying properties used to simplify an algebraic expression
  - Multi-Step Equations (9 topics)
    - Identifying solutions to a linear equation in one variable: Two-step equations
    - Using two steps to solve an equation with whole numbers
    - Additive property of equality with a negative coefficient
    - Solving a two-step equation with integers
    - Plotting the solution for a two-step equation on a number line
    - Introduction to solving an equation with parentheses
    - Solving a two-step equation with signed decimals
    - Identifying properties used to solve a linear equation
    - Introduction to solving an equation with variables on the same side

- Applications of Equations (7 topics)
  - Choosing stories that can be represented by given one-step equations
  - Translating a sentence into a multi-step equation
  - Writing an equation of the form  $Ax + B = C$  to solve a word problem
  - Comparing arithmetic and algebraic solutions to a word problem
  - Choosing stories that can be represented by given two-step equations
  - Solving a decimal word problem using a linear equation of the form  $Ax + B = C$
  - Writing an equation of the form  $A(x + B) = C$  to solve a word problem
- Writing and Graphing Inequalities (5 topics)
  - Translating a sentence by using an inequality symbol
  - Translating a sentence into a one-step inequality
  - Introduction to identifying solutions to an inequality
  - Writing an inequality for a real-world situation
  - Graphing a linear inequality on the number line
- One-Step Inequalities (5 topics)
  - Identifying solutions to a one-step linear inequality
  - Additive property of inequality with whole numbers
  - Additive property of inequality with integers
  - Multiplicative property of inequality with whole numbers
  - Multiplicative property of inequality with integers
- Multi-Step Inequalities (4 topics)
  - Identifying solutions to a two-step linear inequality in one variable
  - Solving a two-step linear inequality with whole numbers
  - Solving a two-step linear inequality: Problem type 1
  - Solving a two-step linear inequality: Problem type 2
- Applications of Inequalities (6 topics)
  - Writing, solving, and graphing the solution to a one-step inequality that models a real-world situation
  - Solving a word problem using a one-step linear inequality
  - Translating a sentence into a multi-step inequality
  - Solving a word problem using a two-step linear inequality and describing the solution
  - Solving a word problem using a two-step linear inequality
  - Solving a decimal word problem using a two-step linear inequality
- Graphs, Functions, and Sequences (19 topics)
  - Ordered Pairs (3 topics)
    - Reading a point in the coordinate plane
    - Plotting a point in the coordinate plane
    - Finding distances between points that share a common coordinate given the graph
  - Tables and Graphs of Lines (2 topics)
    - Function tables with two-step rules
    - Graphing a line in quadrant 1
  - Proportional Relationships (11 topics)
    - Making a table and plotting points given a unit rate
    - Writing an equation to represent a proportional relationship
    - Identifying proportional relationships in equations
    - Identifying proportional relationships in tables by calculating unit rates: Whole numbers
    - Identifying proportional relationships in tables by calculating unit rates: Fractions
    - Determining whether a relationship is proportional given a real-world situation
    - Identifying proportional relationships in graphs: Basic
    - Identifying proportional relationships in graphs: Advanced
    - Graphing a relationship given a real-world situation to determine if the relationship is proportional
    - Writing an equation and describing a proportional relationship given a graph or table
    - Finding outputs and rate of increase given the graph of a line that models a real-world situation
  - Applications (3 topics)
    - Finding outputs of a one-step function that models a real-world situation: Two variable equation
    - Writing and evaluating a function that models a real-world situation: Basic
    - Writing an equation and drawing its graph to model a real-world situation: Basic
- Lines, Angles, and Polygons (28 topics)
  - Classifying and Measuring Angles (3 topics)
    - Acute, obtuse, and right angles
    - Measuring an angle with the protractor
    - Drawing an angle with the protractor
  - Angle Relationships (7 topics)



- Introduction to angle addition
- Finding an angle measure in a figure with a right or straight angle
- Solving an equation involving complementary or supplementary angles
- Writing and solving an equation involving complementary or supplementary angles
- Identifying supplementary and vertical angles
- Finding angle measures given two intersecting lines
- Solving equations involving vertical angles
- Classifying Triangles (3 topics)
  - Acute, obtuse, and right triangles
  - Classifying scalene, isosceles, and equilateral triangles by side lengths
  - Classifying scalene, isosceles, and equilateral triangles by side lengths or angles
- Angles of Triangles (3 topics)
  - Finding an angle measure of a triangle given two angles
  - Finding an angle measure for a triangle with an extended side
  - Finding an angle measure given extended triangles
- Triangle Constructions and Triangle Inequalities (7 topics)
  - Creating triangles from given side lengths: Problem type 1
  - Creating triangles from given side lengths: Problem type 2
  - Using triangle inequality to determine if side lengths form a triangle
  - Determining if a triangle is possible based on given angle measures
  - Determining if given measurements define a unique triangle, more than one triangle, or no triangle
  - Drawing triangles with given conditions: Angle measures
  - Relationship between angle measures and side lengths in a triangle
- Polygons and Quadrilaterals (5 topics)
  - Shared attributes among categories of quadrilaterals
  - Identifying parallelograms, rectangles, and squares
  - Properties of quadrilaterals
  - Classifying parallelograms
  - Sum of the angle measures of a quadrilateral
- Perimeter, Area, and Volume (49 topics)
  - Perimeter (1 topics)
    - Finding the missing length in a figure
  - Area of Rectangles (2 topics)
    - Word problem involving the area of a rectangle: Problem type 2
    - Finding side lengths of rectangles given one dimension and an area or a perimeter
  - Area of Parallelograms, Triangles, and Trapezoids (5 topics)
    - Area of a parallelogram
    - Finding the area of a right triangle on a grid
    - Area of a triangle
    - Finding the area of a trapezoid on a grid by using triangles and rectangles
    - Area of a trapezoid
  - Area of Composite Figures (5 topics)
    - Finding the area of a composite figure on a grid
    - Area of a piecewise rectangular figure
    - Word problem on finding the area of a piecewise rectangular figure
    - Area between two rectangles
    - Area involving rectangles and triangles
  - Circumference and Area of Circles (9 topics)
    - Circumference of a circle
    - Finding the radius or the diameter of a circle given its circumference
    - Informal argument for the formula of the circumference of a circle
    - Area of a circle
    - Circumference and area of a circle
    - Informal argument for the formula of the area of a circle
    - Area involving rectangles and circles
    - Area between two concentric circles
    - Area involving inscribed figures
  - Three-Dimensional Figures (3 topics)
    - Classifying solids
    - Nets of solids
    - Identifying horizontal and vertical cross sections of solids
  - Volume of Prisms and Cylinders (9 topics)

- Volume of a rectangular prism
- Writing equivalent expressions for the volume of a rectangular prism
- Word problem involving the volume of a rectangular prism
- Volume of a piecewise rectangular prism
- Word problem involving the volume of a piecewise rectangular prism
- Volume of a triangular prism
- Word problem involving the volume of a triangular prism
- Volume of a cylinder
- Word problem involving the volume of a cylinder
- Volume of Pyramids, Cones, and Spheres (3 topics)
  - Volume of a pyramid
  - Relating the volumes of a rectangular prism and a rectangular pyramid
  - Relating the volumes of a triangular prism and a triangular pyramid
- Surface Area (12 topics)
  - Surface area of a cube or a rectangular prism
  - Using a net to find the surface area of a rectangular prism
  - Using a net to find the lateral surface area and total surface area of a rectangular prism
  - Word problem involving the surface area of a rectangular prism
  - Surface area of a triangular prism
  - Using a net to find the surface area of a triangular prism
  - Using a net to find the lateral surface area and total surface area of a triangular prism
  - Surface area of a cylinder
  - Word problem involving the surface area of a cylinder
  - Word problem involving the surface area of rectangular prisms and cylinders
  - Using a net to find the lateral surface area and total surface area of a pyramid
  - Word problem involving the surface area of rectangular prisms and pyramids
- Data Analysis and Probability (41 topics)
  - Collecting Data (4 topics)
    - Choosing an appropriate method for gathering data: Problem type 1
    - Choosing an appropriate method for gathering data: Problem type 2
    - Introduction to expectation
    - Making predictions using experimental data for compound events
  - Graphs of Data (5 topics)
    - Constructing a line plot
    - Making part-to-whole, part-to-part, and equivalence comparisons given a line plot
    - Making part-to-whole, part-to-part, and equivalence comparisons given a bar graph
    - Angle measure in a circle graph
    - Constructing a percent bar graph
  - Mean, Median, and Mode (3 topics)
    - Finding the mean of a symmetric distribution
    - Finding sample size and comparing samples for estimating the mean
    - Mean and median of a data set
  - Measures of Variation (7 topics)
    - Range of a data set
    - Interpreting a box-and-whisker plot
    - Interpreting a box-and-whisker plot: Problem type 2
    - Using box-and-whisker plots to compare data sets
    - Comparing sample means
    - Computing mean absolute deviation from a list of numerical values
    - Assessing the degree of overlap of two distributions
  - Counting (1 topics)
    - Interpreting a tree diagram
  - Probability of Simple Events (8 topics)
    - Classifying likelihood
    - Determining a sample space and outcomes for an event: Experiment involving a single selection
    - Introduction to the probability of an event
    - Probability involving one die or choosing from  $n$  distinct objects
    - Probability involving choosing from objects that are not distinct
    - Understanding likelihood
    - Probabilities of an event and its complement
    - Experimental and theoretical probability
  - Probability of Compound Events (7 topics)
    - Determining a sample space and outcomes for an event: Experiment involving multiple selections
    - Outcomes and event probability



- Experimental and theoretical probability for compound events
- Probabilities involving two rolls of a die
- Identifying independent events given descriptions of experiments
- Probability of independent events
- Probability of dependent events
- Simulations (6 topics)
  - Identifying outcomes in a random number table used to simulate a simple event
  - Using a random number table to simulate a simple event
  - Generating a random number table with technology to simulate a simple event
  - Identifying outcomes in a random number table used to simulate a compound event
  - Using a random number table to simulate a compound event
  - Generating a random number table with technology to simulate a compound event
- Other Topics Available(\*) (894 additional topics)
  - Whole Numbers and Integers (80 topics)
    - Whole number place value: Problem type 1
    - Whole number place value: Problem type 2
    - Comparing place values of digits in a whole number: Problem type 1
    - Numeral translation: Problem type 1
    - Numeral translation: Problem type 2
    - Expanded form: 2 and 3-digit numbers
    - Expanded form: 4 and 5-digit numbers
    - Expanded form with zeros
    - Adding 3 numbers with two, three, and four-digits
    - Subtraction involving 3-digit numbers without regrouping
    - Subtraction with multiple regrouping steps involving 4-digit numbers
    - Word problem with addition or subtraction of whole numbers
    - Perimeter of a polygon
    - Perimeter of a rectangle on a grid
    - Multiplication as repeated addition
    - Understanding multiplication of a one-digit number with a larger number
    - Area of a rectangle on a grid
    - Area of a rectangle with one-digit side lengths
    - Introduction to multiplication using an area model
    - Multiplying a multi-digit and a 1-digit number using an area model
    - Writing a division sentence for equal groups
    - Writing a division sentence for equal groups and a remainder
    - Quotient with remainder: 1-digit divisor, 3-digit or 4-digit dividend
    - Division involving quotients with intermediate zeros: Problem type 1
    - Division involving quotients with intermediate zeros: Problem type 2
    - Division with remainder involving quotients with intermediate zeros: Problem type 1
    - Division with remainder involving quotients with intermediate zeros: Problem type 2
    - Division with remainder and a two-digit divisor: Problem type 1
    - Division with remainder and a two-digit divisor: Problem type 2
    - Word problem with division of whole numbers and rounding: Problem type 1
    - Word problem with division of whole numbers and rounding: Problem type 2
    - Comparing a numerical expression with a number
    - Ordering large numbers
    - Rounding to tens or hundreds
    - Rounding to hundreds or thousands
    - Rounding to thousands, ten thousands, or hundred thousands
    - Estimating a sum of whole numbers: Problem type 1
    - Estimating a sum of whole numbers: Problem type 2
    - Estimating a difference of whole numbers: Problem type 1
    - Estimating a difference of whole numbers: Problem type 2
    - Estimating a quotient
    - Writing expressions using exponents
    - Power of 10: Positive exponent
    - Comparing numerical expressions with parentheses
    - Order of operations with whole numbers and grouping symbols
    - Order of operations with whole numbers and exponents: Advanced
    - Even and odd numbers
    - Divisibility rules for 2, 5, and 10
    - Divisibility rules for 3 and 9
    - Prime numbers
    - Prime factorization
    - Prime factorization: Exponent notation
    - Greatest common factor of 3 numbers
    - Least common multiple of 2 numbers
    - Least common multiple of 3 numbers
    - Word problem involving the least common multiple of 2 numbers

- Word problem with common multiples
- Comparing integers using a number line
- Using a number line to compare signed numbers in context
- Interpreting a table of signed numbers that relate to a real-world situation: Problem type 1
- Interpreting a table of signed numbers that relate to a real-world situation: Problem type 2
- Comparing signed numbers relating to a real-world situation
- Finding opposites of integers
- Interpreting absolute values in context as distances from zero
- Finding all numbers with a given absolute value
- Addition and subtraction with 4 or 5 integers
- Operations with absolute value: Problem type 2
- Finding the distance between two rational numbers on a number line in context
- Finding a point on a number line given the length of a segment and another point
- Establishing rules for multiplying integers: Product of a positive and negative number
- Establishing rules for multiplying integers: Product of two negative numbers NEW
- Exponents and integers: Problem type 2
- Order of operations with integers and exponents
- Evaluating an algebraic expression: Whole number addition or subtraction
- Evaluating an algebraic expression: Whole number multiplication or division
- Evaluating an algebraic expression: Whole number operations and exponents
- Evaluating a quadratic expression: Integers
- Plotting the solution for a one-step equation on a number line
- Distinguishing between expressions and equations
- Distinguishing between expressions and equations given verbal descriptions NEW
- Fractions (52 topics)
  - Understanding equivalent fractions: Problem type 1
  - Understanding equivalent fractions: Problem type 2
  - Modeling and writing equivalent fractions
  - Introduction to finding equivalent fractions: Multiplying
  - Introduction to finding equivalent fractions: Dividing
  - Position of fractions on a number line
  - Comparing fractions with the same numerator
  - Writing a mixed number and an improper fraction for a shaded region
  - Position of mixed numbers on a number line
  - Addition or subtraction of fractions with the same denominator
  - Decomposing a fraction into a sum of fractions with the same denominator
  - Introduction to adding fractions with variables and common denominators
  - Writing unit fractions with a common denominator to add or subtract
  - Addition and subtraction of 3 fractions with different denominators
  - Signed fraction addition or subtraction: Advanced
  - Addition and subtraction of 3 fractions involving signs
  - Fractional part of a circle
  - Addition or subtraction of mixed numbers with the same denominator
  - Addition of mixed numbers with the same denominator and renaming: Problem type 1
  - Addition of mixed numbers with the same denominator and renaming: Problem type 2
  - Subtraction of mixed numbers with the same denominator and renaming: Problem type 1
  - Subtraction of mixed numbers with the same denominator and renaming: Problem type 2
  - Addition or subtraction of mixed numbers with different denominators without renaming
  - Addition of mixed numbers with different denominators and renaming
  - Subtraction of mixed numbers with different denominators and renaming
  - Addition and subtraction of 3 mixed numbers with different denominators
  - Word problem involving addition or subtraction of mixed numbers with different denominators
  - Multiplication of 3 fractions
  - Modeling multiplication of proper fractions
  - Signed fraction multiplication: Advanced
  - Multi-step word problem involving fractions and multiplication
  - Determining if a quantity is increased or decreased when multiplied by a fraction
  - Finding the product to determine whether a quantity is increased or decreased when multiplied by a fraction NEW
  - Understanding the relationship between dividing by a fraction and multiplying by its reciprocal NEW
  - Fact families for multiplication and division of fractions
  - Modeling division of a whole number by a fraction
  - Multiplying mixed numbers: Problem type 1
  - Multiplying mixed numbers: Problem type 2
  - Multiplying a mixed number and a whole number: Problem type 2
  - Mixed number division
  - Word problem involving multiplication or division with mixed numbers
  - Evaluating expressions with exponents of zero
  - Exponents and signed fractions
  - Order of operations with fractions: Problem type 1
  - Order of operations with fractions: Problem type 2
  - Order of operations with fractions: Problem type 3
  - Complex fraction without variables: Problem type 1
  - Evaluating a linear expression: Signed fraction multiplication with addition or subtraction

- Additive property of equality with fractions and mixed numbers
- Additive property of equality with signed fractions
- Multiplicative property of equality with whole numbers: Fractional answers
- Multiplicative property of equality with fractions
- Decimals (46 topics)
  - Writing a decimal and a fraction for a shaded region
  - Decimal place value: Hundreds to ten thousandths
  - Writing a decimal number less than 1 given its name
  - Writing a decimal number greater than 1 given its name
  - Writing a decimal number given its name: Advanced
  - Reading decimal position on a number line: Tenths
  - Reading decimal position on a number line: Hundredths
  - Understanding decimal position on a number line using zoom: Hundredths
  - Understanding decimal position on a number line using zoom: Thousandths
  - Ordering decimals
  - Converting a decimal to a proper fraction without simplifying: Advanced
  - Converting a decimal to a proper fraction in simplest form: Advanced
  - Converting a decimal to a mixed number and an improper fraction in simplest form: Advanced
  - Addition of decimals: Vertically aligned
  - Decimal addition with 3 numbers
  - Subtraction of aligned decimals
  - Decimal addition and subtraction with 3 or more numbers
  - Estimating a decimal sum or difference
  - Signed decimal addition and subtraction with 3 numbers
  - Computing distances between decimals on a number line
  - Word problem with addition of 3 or 4 decimals and whole numbers
  - Decimal multiplication: Problem type 2
  - Multiplying decimals less than 1: Problem type 2
  - Estimating a product of decimals
  - Word problem with multiplication of two decimals
  - Division of a decimal by a power of 0.1
  - Whole number division with decimal answers
  - Division of a decimal by a 1-digit decimal: Problem type 1
  - Division of a decimal by a 2-digit decimal
  - Decimal division with rounding
  - Average of two numbers
  - Signed decimal division
  - Word problem with division of two decimals
  - Converting a fraction with a denominator of 100 or 1000 to a decimal
  - Converting a fraction to a repeating decimal: Advanced
  - Using a calculator to convert a fraction to a rounded decimal
  - Converting a mixed number to a terminating decimal: Advanced
  - Converting a fraction or mixed number to a rounded decimal
  - Ordering fractions and decimals
  - Interpreting a Venn diagram of 2 sets
  - Interpreting a Venn diagram of 3 sets
  - Constructing a Venn diagram to classify rational numbers
  - Constructing a Venn diagram to describe relationships between sets of rational numbers
  - Order of operations with decimals: Problem type 3
  - Addition or subtraction with a decimal and a mixed number
  - Multiplication with a decimal and a fraction
- Ratios, Proportions, and Measurement (57 topics)
  - Writing ratios using different notations
  - Writing ratios for real-world situations
  - Writing a ratio and finding a quantity in an equivalent ratio in context
  - Identifying statements that describe a ratio
  - Simplifying a ratio of whole numbers: Problem type 1
  - Simplifying a ratio of decimals
  - Finding missing values in a table of equivalent ratios: Given a part-to-part ratio
  - Finding missing values in a table of equivalent ratios: Given a part-to-whole ratio NEW
  - Word problem on proportions: Problem type 2
  - Word problem with powers of ten
  - Identifying similar or congruent shapes on a grid
  - Similar right triangles
  - Indirect measurement
  - Investigating the effects on the area for non-proportional and proportional figures
  - Choosing a measuring tool
  - Choosing U.S. Customary measurement units
  - Measuring length to the nearest inch
  - Measuring length to the nearest quarter or half inch
  - Writing and solving a proportion to convert U.S. Customary units of length NEW
  - Conversions involving measurements in feet and inches

- Adding measurements in feet and inches
  - U.S. Customary length conversions involving rounding decimals
  - Word problem involving a U.S. Customary length conversion
  - U.S. Customary unit conversion with whole number values: Two-step conversion
  - U.S. Customary unit conversion with mixed number values: One-step conversion
  - U.S. Customary unit conversion with mixed number values: Two-step conversion
  - U.S. Customary area unit conversion with whole number values
  - Word problem on area involving conversions of U.S. Customary units: Problem type 1
  - Unit conversions involving acres and hectares
  - Choosing metric measurement units
  - Measuring length to the nearest centimeter
  - Measuring length to the nearest millimeter
  - Metric distance conversion with whole number values
  - [Writing and solving a proportion to convert metric units of length](#) NEW
  - Metric distance conversion with decimal values
  - Metric mass or volume conversion with whole numbers
  - Metric conversion with decimal values: Two-step problem
  - Metric area unit conversion with decimal values
  - Word problem involving adding or subtracting time within the hour
  - Introduction to adding time
  - Adding time
  - Word problem on elapsed time within the hour
  - Word problem on elapsed time less than one hour
  - Word problem on elapsed time more than one hour
  - Word problem on elapsed times crossing a.m. and p.m.
  - Reading a positive temperature from a thermometer
  - Reading the temperature from a thermometer
  - Converting between temperatures in Fahrenheit and Celsius
  - Simplifying a ratio of whole numbers: Problem type 2
  - Solving a word problem involving rates and time conversion
  - Converting between metric and U.S. Customary unit systems using dimensional analysis: U.S. Customary to metric
  - [Converting between metric and U.S. Customary unit systems using dimensional analysis: Metric to U.S. Customary](#) NEW
  - Word problem involving U.S. Customary length conversions using dimensional analysis
  - Word problem involving a conversion between U.S. Customary units of weight and metric units of mass
  - Converting between compound units: Advanced
  - Conversions with currency
  - Word problem involving conversion between compound units using dimensional analysis
- Percents (44 topics)
- Finding the percentage of a grid that is shaded
  - Representing benchmark percentages on a grid
  - Converting a mixed number percentage to a decimal
  - Converting between percentages and decimals in a real-world situation
  - Converting a percentage to a fraction in simplest form
  - Converting a decimal percentage to a fraction
  - Comparing fractions, decimals, and percentages using a number line
  - Using a calculator to convert a fraction to a rounded percentage
  - Writing a ratio as a percentage
  - Applying the percent equation: Problem type 2
  - Interpreting a circle graph or pie chart
  - Computations from a circle graph
  - Finding the multiplier to give a final amount after a percentage increase or decrease
  - Combined effect of more than one markup or discount
  - Finding the original amount given the result of a percentage increase or decrease
  - Finding the original price given the sale price and percent discount
  - Finding the absolute error and percent error of a measurement
  - Finding the principal, rate, or time of a simple interest loan or investment
  - Computing the interest and repayment amount for a simple interest loan whose term is given in months or days
  - Finding the principal, rate, or time for a simple interest loan whose term is given in months or days
  - Comparing discounts
  - Examining a savings plan for college
  - Calculations involving paying for college
  - Comparing total costs for attending different colleges
  - Distinguishing between fixed and variable expenses
  - Computing percentages for categories of a budget
  - Computations involving cost of living and hourly wage
  - Using a family budget estimator to determine the minimum monthly budget and average hourly wage needed for a family
  - Comparing annual salaries of different occupations
  - Hourly gross pay with overtime
  - Gross pay with commission and salary
  - Calculations involving purchases with debit and credit cards

Deciding when it is applicable to pay with cash or credit and examining the advantages and disadvantages of different

- payment methods

NEW

- Comparing costs of checking accounts
- Balancing a check register
- Reading a credit report
- Determining the value of credit reports to borrowers and lenders NEW
- Understanding the impact of a credit score
- Computing a person's net worth
- Word problem on financial responsibility
- Calculating and comparing monthly payments using the ALEKS loan calculator
- Calculating monthly payment, total payment, and interest using the ALEKS loan calculator
- Calculating and comparing total loan payments using the ALEKS loan calculator
- Using the ALEKS periodic deposit calculator to compute savings which include periodic deposits

- Equations and Inequalities (71 topics)

- Introduction to the distributive property
- Understanding the distributive property
- Introduction to factoring with numbers
- Factoring a sum or difference of whole numbers
- Distributive property: Integer coefficients
- Identifying like terms
- Properties of addition
- Properties of real numbers
- Combining like terms: Decimal coefficients
- Combining like terms: Fractional coefficients
- Using algebra tiles to determine if two expressions are equivalent
- Identifying parts in an algebraic expression
- Identifying equivalent algebraic expressions
- Using distribution with double negation and combining like terms to simplify: Multivariate
- Combining like terms in a quadratic expression
- Adding rational expressions with different denominators and a single occurrence of a variable
- Solving an equation to find the value of an expression
- Solving a multi-step equation given in fractional form
- Solving a linear equation with several occurrences of the variable: Variables on the same side
- Clearing fractions in an equation
- Solving a two-step equation with signed fractions
- Solving a proportion of the form  $(x+a)/b = c/d$
- Introduction to solving a rational equation
- Solving a rational equation that simplifies to linear: Denominator  $x$
- Introduction to solving an absolute value equation
- Solving an absolute value equation: Problem type 1
- Introduction to solving a linear equation with a variable on each side
- Solving a linear equation with several occurrences of the variable: Variables on both sides
- Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
- Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
- Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
- Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- Solving equations with zero, one, or infinitely many solutions
- Solving a proportion of the form  $a/(x+b) = c/x$
- Solving for a variable in terms of other variables using addition or subtraction: Basic
- Solving for a variable in terms of other variables using addition or subtraction: Advanced
- Solving for a variable in terms of other variables using multiplication or division: Basic
- Solving for a variable in terms of other variables using multiplication or division: Advanced
- Solving for a variable in terms of other variables using addition or subtraction with division
- Solving for a variable inside parentheses in terms of other variables
- Solving for a variable in terms of other variables in a linear equation with fractions
- Solving a fraction word problem using a linear equation of the form  $Ax = B$
- Solving a word problem with two unknowns using a linear equation
- Writing an equation to represent a real-world problem: Variable on both sides
- Writing and solving a real-world problem given an equation with the variable on both sides
- Solving a decimal word problem using a linear equation with the variable on both sides
- Solving a fraction word problem using a linear equation with the variable on both sides
- Solving a word problem with three unknowns using a linear equation
- Solving a word problem involving consecutive integers
- Solving a value mixture problem using a linear equation
- Solving a percent mixture problem using a linear equation
- Solving a distance, rate, time problem using a linear equation
- Writing an inequality given a graph on the number line
- Translating a sentence into a compound inequality
- Graphing a compound inequality on the number line
- Writing a compound inequality given a graph on the number line
- Additive property of inequality with signed fractions



- Additive property of inequality with signed decimals
- Multiplicative property of inequality with signed fractions
- Solving a two-step linear inequality with a fractional coefficient
- Solving a linear inequality with multiple occurrences of the variable: Problem type 1
- Solving a linear inequality with multiple occurrences of the variable: Problem type 2
- Solving a linear inequality with multiple occurrences of the variable: Problem type 3
- Solving a decimal word problem using a linear inequality with the variable on both sides
- Constructing a Venn diagram with 2 sets
- Interpreting Venn diagram cardinalities with 2 sets for a real-world situation
- Constructing a Venn diagram with 2 sets to solve a word problem
- Constructing a Venn diagram with 3 sets
- Interpreting Venn diagram cardinalities with 3 sets for a real-world situation
- Constructing a Venn diagram with 3 sets to solve a word problem
- Graphs, Functions, and Sequences (169 topics)
  - Reading a point in quadrant 1
  - Plotting a point in quadrant 1
  - Plotting a point in quadrant 1: Mixed number coordinates
  - Plotting a point in the coordinate plane: Mixed number coordinates
  - Naming the quadrant or axis of a point given its graph
  - Naming the quadrant or axis of a point given its coordinates
  - Naming the quadrant or axis of a point given the signs of its coordinates
  - Finding distances between points that share a common coordinate given their coordinates
  - Plotting points that share a coordinate and using absolute value to find the distance between them
  - Midpoint of a line segment in the plane
  - Table for a linear equation
  - Writing a function rule given a table of ordered pairs: One-step rules
  - Writing a function rule given a table of ordered pairs: Two-step rules
  - Identifying solutions to a linear equation in two variables
  - Finding the coordinates of a point on a graph given the equation
  - Finding a solution to a linear equation in two variables
  - Comparing two rules with forms of  $y=ax$  and  $y=x+a$
  - Graphing a linear equation of the form  $y = mx$
  - Graphing a line given its equation in slope-intercept form: Integer slope
  - Graphing a line given its equation in slope-intercept form: Fractional slope
  - Graphing a line given its equation in standard form
  - Graphing a vertical or horizontal line
  - Finding x- and y-intercepts given the graph of a line on a grid
  - Finding x- and y-intercepts of a line given the equation: Basic
  - Finding x- and y-intercepts of a line given the equation: Advanced
  - Graphing a line given its x- and y-intercepts
  - Graphing a line by first finding its x- and y-intercepts
  - Identifying parallel and perpendicular lines
  - Interpreting a line graph
  - Comparing proportional relationships given in different forms
  - Finding slope given the graph of a line in quadrant 1 that models a real-world situation
  - Classifying slopes given graphs of lines
  - Finding slope given the graph of a line on a grid
  - Finding slope given two points on a line
  - Finding the slopes of horizontal and vertical lines
  - Using right triangles to find the slope of a line
  - Finding the coordinate that yields a given slope
  - Graphing a line given its slope and y-intercept
  - Graphing a line through a given point with a given slope
  - Identifying direct variation equations
  - Identifying direct variation from ordered pairs and writing equations
  - Writing a direct variation equation
  - Word problem on direct variation
  - Interpreting direct variation from a graph
  - Writing an inverse variation equation
  - Identifying direct and inverse variation equations
  - Identifying direct and inverse variation from ordered pairs and writing equations
  - Word problem on inverse variation
  - Word problem on inverse variation involving the completion of a task
  - Identifying linear equations: Basic
  - Identifying linear functions given ordered pairs
  - Rewriting a linear equation in the form  $Ax + By = C$
  - Finding the slope and y-intercept of a line given its equation in the form  $y = mx + b$
  - Finding the slope and y-intercept of a line given its equation in the form  $Ax + By = C$
  - Graphing a line by first finding its slope and y-intercept
  - Writing an equation of a line given its slope and y-intercept
  - Writing an equation and graphing a line given its slope and y-intercept
  - Finding the slope and y-intercept given a table for a linear function
  - Finding the slope, y-intercept, and equation for a linear function given a table of values



- Writing an equation in slope-intercept form given the slope and a point
- Deriving the equation of a line through the origin NEW
- Deriving the equation of a line not going through the origin NEW
- Finding the slope and a point on a line given its equation in point-slope form
- Graphing a line given its equation in point-slope form
- Writing the equation of a line in point-slope form given the slope and a point
- Writing the equation of a line in standard form given the slope and a point
- Writing the equation of a line given the y-intercept and another point
- Writing the equation of a line through two given points
- Writing the equations of vertical and horizontal lines through a given point
- Writing the equation and finding the slope of a line parallel or perpendicular to a vertical or horizontal line
- Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
- Finding slopes of lines parallel and perpendicular to a line given in the form  $Ax + By = C$
- Identifying parallel and perpendicular lines from equations
- Writing equations of lines parallel and perpendicular to a given line through a point
- Identifying parallel and perpendicular lines from coordinates
- Finding outputs of a two-step function with decimals that models a real-world situation: Two variable equation
- Finding inputs and outputs of a two-step function that models a real-world situation: Two variable equation
- Writing and evaluating a function that models a real-world situation: Advanced
- Graphing ordered pairs and writing an equation from a table of values in context
- Writing a linear equation that models a real-world situation given a graph or a table of values
- Writing an equation and drawing its graph to model a real-world situation: Advanced
- Finding the intercepts and rate of change given a graph of a linear function
- Finding the initial amount and rate of change given a table for a linear function
- Finding the initial amount and rate of change given two points for a linear function
- Comparing properties of linear functions given in different forms
- Interpreting the parameters of a linear function that models a real-world situation
- Application problem with a linear function: Finding a coordinate given the slope and a point
- Application problem with a linear function: Finding a coordinate given two points
- Identifying independent and dependent quantities from tables and graphs
- Identifying independent and dependent variables from equations or real-world situations
- Solving a linear equation by graphing NEW
- Identifying functions from relations
- Identifying functions given a verbal description NEW
- Vertical line test
- Domain and range from ordered pairs
- Table for a linear function
- Evaluating functions: Linear and quadratic or cubic
- Finding outputs of a one-step function that models a real-world situation: Function notation
- Finding outputs of a two-step function with decimals that models a real-world situation: Function notation
- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
- Domain and range of a linear function that models a real-world situation
- Finding an output of a function from its graph
- Finding inputs and outputs of a function from its graph
- Finding and interpreting an output of a linear function given a graph that models a real-world situation
- Domain and range from the graph of a discrete relation
- Finding domain and range from a linear graph in context
- Interpreting the domain and range of a linear function in context
- Finding where a function is increasing, decreasing, or constant given the graph
- Choosing a graph to fit a narrative: Basic
- Choosing a graph to fit a narrative: Advanced
- Drawing a graph to fit a narrative
- Graphing an integer function and finding its range for a given domain
- Graphing a function of the form  $f(x) = ax + b$ : Integer slope
- Graphing a function of the form  $f(x) = ax + b$ : Fractional slope
- Graphing an absolute value equation of the form  $y = |x|$
- Graphing an absolute value equation in the plane: Basic
- Graphing an absolute value equation in the plane: Advanced
- Determining if a function is linear given its graph
- Graphing a parabola of the form  $y = ax^2$
- Graphing a parabola of the form  $y = ax^2 + c$
- Graphing a function of the form  $f(x) = ax^2$
- Graphing a function of the form  $f(x) = ax^2 + c$
- Graphing a cubic function of the form  $y = ax^3$
- Finding the first terms of an arithmetic sequence using an explicit rule
- Finding the next terms of an arithmetic sequence with whole numbers
- Finding the next terms of an arithmetic sequence with integers
- Identifying arithmetic sequences and finding the common difference
- Finding a specified term of an arithmetic sequence given the first terms
- Finding a specified term of an arithmetic sequence given the common difference and first term
- Writing an explicit rule for an arithmetic sequence
- Finding the first terms of a geometric sequence using an explicit rule
- Finding the next terms of a geometric sequence with whole numbers

- Finding the next terms of a geometric sequence with signed numbers
- Identifying arithmetic and geometric sequences
- Identifying geometric sequences and finding the common ratio
- Finding a specified term of a geometric sequence given the first terms
- Finding a specified term of a geometric sequence given the common ratio and first term
- Arithmetic and geometric sequences: Identifying and writing an explicit rule
- Finding patterns in shapes
- Identifying solutions to a system of linear equations
- Identifying the solution of systems of linear equations from graphs
- Graphically solving a system of linear equations both of the form  $y=mx+b$
- Graphing a system of linear equations and estimating a solution
- Graphically solving a system of linear equations
- Writing a system of linear equations given its graph
- Introduction to using substitution to solve a linear equation
- Solving a system of linear equations of the form  $y = mx + b$
- Solving a system of linear equations using substitution
- Solving a system of linear equations using elimination with addition
- Solving a system of linear equations using elimination with multiplication and addition
- Solving systems of linear equations with 0, 1, or infinitely many solutions
- Interpreting the graphs of two functions
- Solving a word problem involving a system of linear equations by graphing and estimating a solution
- Solving a word problem involving a sum and another basic relationship using a system of linear equations
- Solving a word problem using a system of linear equations of the form  $Ax + By = C$
- Writing and solving a system of two linear equations given a table of values
- Writing and solving a system of two linear equations given a verbal description (NEW)
- Solving a word problem using a system of linear equations of the form  $y = mx + b$
- Solving a value mixture problem using a system of linear equations
- Addition or subtraction of matrices
- Identifying solutions to a linear inequality in two variables
- Graphing a linear inequality in the plane: Vertical or horizontal line
- Graphing a linear inequality in the plane: Slope-intercept form
- Graphing a linear inequality in the plane: Standard form
- Writing an inequality given its graph in the plane: Horizontal or vertical boundary line
- Writing an inequality given its graph in the plane: Slanted boundary line
- Graphing a system of two linear inequalities: Basic
- Graphing a system of two linear inequalities: Advanced
- Writing a linear inequality in two variables given a table of values
- Exponents, Polynomials, and Radicals (129 topics)
  - Introduction to the product rule with positive exponents: Whole number base
  - Understanding the product rule of exponents
  - Introduction to the product rule of exponents
  - Product rule with positive exponents: Univariate
  - Product rule with positive exponents: Multivariate
  - Ordering numbers with positive exponents
  - Introduction to the power of a power rule with positive exponents: Whole number base
  - Understanding the power rules of exponents
  - Introduction to the power of a power rule of exponents
  - Introduction to the power of a product rule of exponents
  - Power rules with positive exponents: Multivariate products
  - Power rules with positive exponents: Multivariate quotients
  - Simplifying a ratio of multivariate monomials: Basic
  - Introduction to the quotient rule with positive exponents: Whole number base
  - Introduction to the quotient rule of exponents
  - Simplifying a ratio of univariate monomials
  - Quotient of expressions involving exponents
  - Simplifying a ratio of multivariate monomials: Advanced
  - Power of 10: Negative exponent
  - Evaluating an expression with a negative exponent: Whole number base
  - Evaluating an expression with a negative exponent: Positive fraction base
  - Evaluating an expression with a negative exponent: Negative integer base
  - Ordering numbers with negative exponents
  - Rewriting an algebraic expression without a negative exponent
  - Introduction to the product rule with negative exponents: Whole number base
  - Introduction to the product rule with negative exponents
  - Introduction to the quotient rule with negative exponents: Whole number base
  - Quotient rule with negative exponents: Problem type 1
  - Introduction to the power of a power rule with negative exponents: Whole number base
  - Power of a power rule with negative exponents
  - Introduction to scientific notation with positive exponents
  - Scientific notation with a positive exponent
  - Introduction to scientific notation with negative exponents
  - Scientific notation with a negative exponent
  - Converting between scientific notation and standard form in a real-world situation

- Estimating numbers using scientific notation
- Choosing metric units and converting to the base unit in scientific notation
- Expressing calculator notation as scientific notation
- Multiplying numbers written in scientific notation: Basic
- Multiplying numbers written in scientific notation: Advanced
- Multiplying numbers written in decimal form or scientific notation in a real-world situation
- Dividing numbers written in scientific notation: Basic
- Dividing numbers written in scientific notation: Advanced
- Finding the scale factor between numbers given in scientific notation in a real-world situation
- Adding or subtracting numbers written in scientific notation: Same exponents, basic
- Adding or subtracting numbers written in scientific notation: Same exponents, advanced
- Adding or subtracting numbers written in scientific notation: Different exponents
- Estimating the sum or difference of two numbers written in scientific notation
- Degree and leading coefficient of a univariate polynomial
- Degree of a multivariate polynomial
- Simplifying a sum or difference of two univariate polynomials
- Simplifying a sum or difference of three univariate polynomials
- Multiplying a univariate polynomial by a monomial with a positive coefficient
- Multiplying a univariate polynomial by a monomial with a negative coefficient
- Multiplying a multivariate polynomial by a monomial
- Multiplying binomials with leading coefficients of 1
- Multiplying binomials with leading coefficients greater than 1
- Multiplying binomials in two variables
- Multiplying conjugate binomials: Univariate
- Squaring a binomial: Univariate
- Multiplication involving binomials and trinomials in one variable
- Multiplication involving binomials and trinomials in two variables
- Introduction to the LCM of two monomials
- Least common multiple of two monomials
- Introduction to the GCF of two monomials
- Greatest common factor of three univariate monomials
- Greatest common factor of two multivariate monomials
- Factoring out a monomial from a polynomial: Univariate
- Factoring a quadratic with leading coefficient 1
- Factoring a perfect square trinomial with leading coefficient 1
- Factoring a difference of squares in one variable: Basic
- Factoring a difference of squares in one variable: Advanced
- Dividing a polynomial by a monomial: Univariate
- Dividing a polynomial by a monomial: Multivariate
- Finding the roots of a quadratic equation with leading coefficient 1
- Square root of a perfect square
- Finding all square roots of a number
- Square root of a rational perfect square
- Square roots of perfect squares with signs
- Using a calculator to approximate a square root
- Estimating a square root
- Using numerical methods to approximate a square root to the nearest tenth
- Using numerical methods to approximate a square root to the nearest hundredth
- Approximating the location of irrational numbers on a number line
- Approximating the location of irrational numbers on a number line to compare them
- Ordering real numbers
- Converting a repeating decimal to a fraction
- Identifying true statements about rational and irrational numbers
- Determining the kind of decimal expansion for real numbers
- Identifying the digits that repeat in the decimal expansion of a rational number: Problem type 1
- Identifying the digits that repeat in the decimal expansion of a rational number: Problem type 2 NEW
- Identifying numbers as rational or irrational
- Constructing a Venn diagram to classify real numbers
- Constructing a Venn diagram to describe relationships between sets of real numbers
- Introduction to simplifying a radical expression with an even exponent
- Square root of a perfect square monomial
- Simplifying the square root of a whole number less than 100
- Simplifying the square root of a whole number greater than 100
- Simplifying a radical expression with an even exponent
- Introduction to simplifying a radical expression with an odd exponent
- Simplifying a radical expression with an odd exponent
- Introduction to square root addition or subtraction
- Square root addition or subtraction
- Introduction to square root multiplication
- Square root multiplication: Basic
- Square root multiplication: Advanced
- Simplifying a quotient of square roots
- Rationalizing a denominator: Quotient involving square roots
- Classifying sums and products as rational or irrational NEW

- Solving an equation of the form  $x^2 = a$  using the square root property
- Finding side lengths of squares given an area and a perimeter
- Introduction to solving a radical equation
- Solving a radical equation that simplifies to a linear equation: One radical, basic
- Word problem involving radical equations: Basic
- Cube root of an integer
- Order of operations with exponents and radicals
- Solving an equation of the form  $x^3 = a$  using integers
- Solving an equation using the odd-root property: Problem type 1
- Rational exponents: Unit fraction exponents and whole number bases
- Rational exponents: Non-unit fraction exponent with a whole number base
- Introduction to the Pythagorean Theorem
- Pythagorean Theorem
- Word problem involving the Pythagorean Theorem
- Word problem involving the Pythagorean Theorem in three dimensions
- Using the Pythagorean Theorem repeatedly
- Using the Pythagorean Theorem to find distance on a grid
- Using the Pythagorean Theorem to find the distance between two points in the plane in context
- Distance between two points in the plane: Exact answers
- Distance between two points in the plane: Decimal answers
- Lines, Angles, and Polygons (48 topics)
  - Naming segments, rays, and lines
  - Naming angles, sides of angles, and vertices
  - [Writing and solving an equation involving adjacent angles](#) NEW
  - Finding supplementary and complementary angles
  - Writing and solving an equation involving vertical angles
  - Identifying corresponding and alternate angles
  - Finding angle measures given two parallel lines cut by a transversal
  - Solving equations involving angles and a pair of parallel lines
  - Establishing facts about the angles created when parallel lines are cut by a transversal
  - Constructing congruent line segments
  - Constructing an angle bisector
  - Constructing congruent angles
  - Constructing the perpendicular bisector of a line segment
  - Constructing a pair of perpendicular lines
  - Constructing a pair of parallel lines
  - Identifying congruent segments in the plane
  - Identifying scalene, isosceles, and equilateral triangles given coordinates of their vertices
  - Finding an angle measure given a triangle and parallel lines
  - Finding angle measures of a triangle given angles with variables
  - Writing an equation to find angle measures of a triangle given angles with variables
  - Finding side lengths and angle measures of isosceles and equilateral triangles
  - Finding angle measures of an isosceles triangle given angles with variables
  - Finding an angle measure for a triangle sharing a side with another triangle
  - Establishing facts about the interior angles of a triangle
  - Establishing facts about the interior and exterior angles of a triangle
  - Drawing triangles with given conditions: Side lengths and angle measures
  - Drawing a circle with a given radius or diameter
  - Drawing triangles with given side lengths using a compass
  - Relationship between angle measures and side lengths in two triangles
  - Sine, cosine, and tangent ratios: Numbers for side lengths
  - Sine, cosine, and tangent ratios: Variables for side lengths
  - Using a calculator to approximate sine, cosine, and tangent values
  - Using the Pythagorean Theorem to find a sine, cosine, or tangent ratio in a right triangle
  - Understanding trigonometric ratios through similar right triangles
  - Relationship between the sines and cosines of complementary angles
  - Using a trigonometric ratio to find a side length in a right triangle
  - Solving a right triangle
  - Using trigonometry to find a length in a word problem with one right triangle
  - Using a trigonometric ratio to find an angle measure in a right triangle
  - Using trigonometry to find angles of elevation or depression in a word problem
  - Special right triangles: Decimal answers
  - Naming polygons
  - Drawing and identifying a polygon in the coordinate plane
  - Finding the coordinates of a point to make a parallelogram
  - Informally deriving the formula for the sum of interior angles of polygons by decomposing them into triangles
  - Finding the sum of the interior angle measures of a convex polygon given the number of sides
  - Finding the number of sides of a convex polygon given the sum of the measures of the interior angles
  - Finding a missing interior angle measure in a convex polygon
- Transformations (47 topics)
  - Identifying transformations
  - Identifying and naming congruent parts of congruent triangles

- Identifying and naming congruent triangles
  - Exploring the triangle congruence theorems
  - Finding angle measures of a triangle given two angles of a similar triangle
  - Finding angle measures and side ratios to determine if two triangles are similar
  - Translating a point and giving its coordinates: One step
  - Translating a point and giving its coordinates: Two steps
  - Properties of translated figures
  - Determining if figures are related by a translation
  - Translating a polygon
  - Using a translated point to find coordinates of other translated points
  - Writing a rule to describe a translation
  - Reflecting a point across an axis
  - Reflecting a point across both coordinate axes
  - Reflecting a point across an axis and giving its coordinates
  - Finding the coordinates of a point reflected across an axis
  - Finding the coordinates of a point reflected across both axes
  - Reflecting a polygon across the x-axis or y-axis
  - Properties of reflected figures
  - Determining if figures are related by a reflection
  - Reflecting a polygon over a vertical or horizontal line
  - Finding the coordinates of three points reflected over an axis
  - Finding the coordinates of a point reflected across an axis and translated
  - Writing a rule to describe a reflection
  - Drawing lines of symmetry
  - Finding an angle of rotation
  - Identifying rotational symmetry and angles of rotation
  - Identifying figures that have rotational symmetry or reflectional symmetry NEW
  - Rotating a point and giving its coordinates
  - Properties of rotated figures
  - Determining if figures are related by a rotation
  - Rotating a figure about the origin
  - Writing a rule to describe a rotation
  - Determining if figures are congruent and related by a transformation
  - Determining if figures are congruent and related by a sequence of transformations
  - Dilating a segment and giving the coordinates of its endpoints
  - The effect of dilation on side length
  - Determining if figures are related by a dilation
  - Finding a scale factor given a dilation in the coordinate plane
  - The effect of dilation on area
  - Dilating a figure
  - Performing a composition of dilations NEW
  - Performing a composition consisting of a rigid transformation and a dilation NEW
  - Writing a rule to describe a dilation
  - Determining if figures are similar and related by a sequence of transformations
  - Identifying transformations and determining if they preserve congruent figures
- Perimeter, Area, and Volume (81 topics)
    - Perimeter of a piecewise rectangular figure
    - Writing algebraic expressions for the perimeter of a figure
    - Finding a side length given the perimeter and side lengths with variables
    - Sides of polygons having the same perimeter
    - Perimeter of a polygon involving mixed numbers and fractions
    - Area of a rectangle with fractional side lengths
    - Area of a rectangle involving mixed number and fractional side lengths
    - Distinguishing between the area and perimeter of a rectangle
    - Areas of rectangles with the same perimeter
    - Word problem on area involving conversions of U.S. Customary units: Problem type 2
    - Word problem on area involving conversions between systems
    - Estimates and exact answers
    - Writing algebraic expressions for the area of a figure
    - Word problem on optimizing an area or perimeter
    - Finding the dimensions of a rectangle given its perimeter and a relationship between sides
    - Finding the perimeter or area of a rectangle given one of these values
    - Finding the perimeter or area of a rectangle in the coordinate plane
    - Finding the area of a right triangle or its corresponding rectangle
    - Solving a word problem involving area using a one-step linear inequality: Area and lengths
    - Finding the area of a right triangle using the Pythagorean Theorem
    - Finding the area of a triangle or parallelogram in the coordinate plane
    - Decomposing a trapezoid or parallelogram to find its area given a situation in context NEW
    - Introduction to area of a piecewise rectangular figure
    - Word problem involving the area between two rectangles
    - Finding an area in terms of variables
    - Finding the area of a trapezoid, rhombus, or kite in the coordinate plane
    - Identifying side lengths that give right triangles



- Demonstrating the converse of the Pythagorean Theorem
- Informal proof of the converse of the Pythagorean Theorem NEW
- Informal proof of the Pythagorean Theorem
- Introduction to a circle: Diameter, radius, and chord
- Identifying chords, secants, and tangents of a circle
- Naming and finding measures of central angles, inscribed angles, and arcs of a circle
- Circumference ratios
- Perimeter involving rectangles and circles
- Circumference and area of a circle: Exact answers in terms of  $\pi$
- Distinguishing between the area and circumference of a circle
- Word problem involving the area between two concentric circles
- Area involving multiple inscribed figures
- Area of a sector of a circle: Exact answer in terms of  $\pi$
- Vertices, edges, and faces of a solid
- Identifying geometric shapes that model real-world objects
- Counting the cubes in a solid made of cubes
- Side views of a solid made of cubes
- Identifying solids generated by rotations of two-dimensional regions NEW
- Volume of a rectangular prism made of unit cubes
- Volume of a solid made of cubes with unit fraction edge lengths
- Volume of a rectangular prism with fractional edge lengths
- Finding the side length of a cube given its volume
- Solving problems involving the volume of a rectangular prism in context
- Word problem involving the rate of filling or emptying a rectangular prism
- Computations involving density, mass, and volume NEW
- Word problem on density involving the volume of a rectangular solid NEW
- Word problem on volume involving conversions of U.S. Customary units
- Describing the formula for the volume of a cylinder
- Word problem involving the rate of filling or emptying a cylinder
- Ratio of volumes
- Converting between U.S. Customary units of volume: Problem type 1
- Converting between metric units of volume and capacity
- Volume of a cone
- Volume of a cone: Exact answers in terms of  $\pi$
- Relating the volumes of a cylinder and a cone
- Word problem involving the volume of a cone
- Volume of a sphere
- Word problem involving the volume of a sphere
- Surface area of a rectangular prism made of unit cubes
- Distinguishing between surface area and volume
- Deriving the formula for the surface area of a rectangular prism NEW
- Word problem involving U.S. Customary conversions, surface area, and cost
- Surface area of a piecewise rectangular prism made of unit cubes
- Deriving the formula for the surface area of a right triangular prism NEW
- Surface area of a cylinder: Exact answers in terms of  $\pi$
- Deriving the formula for the surface area of a cylinder NEW
- Lateral surface area and surface area of a cone
- Lateral surface area and surface area of a cone: Exact answers in terms of  $\pi$
- Surface area of a sphere
- Side lengths, perimeters, and areas of similar polygons
- Identifying similar solids
- Computing ratios of side lengths, surface areas, and volumes for similar solids
- Computing side length, surface area, and volume for similar solids
- Word problem involving volumes of similar solids
- Data Analysis and Probability (70 topics)
  - Identifying statistical questions
  - Classifying samples
  - Interpreting a tally table
  - Constructing a frequency distribution for grouped data
  - Constructing a frequency distribution for non-grouped data
  - Constructing a relative frequency distribution for grouped data
  - Constructing a two-way frequency table: Basic
  - Constructing a two-way frequency table: Advanced
  - Computing a percentage from a table of values
  - Making an inference using a two-way frequency table
  - Calculating relative frequencies in a contingency table
  - Calculating relative frequencies in a contingency table: Advanced
  - Finding if a question can be answered by the data
  - Constructing a line plot with fractional values: Fourths
  - Constructing a bar graph for non-numerical data
  - Interpreting a bar graph
  - Interpreting a double bar graph
  - Constructing a frequency distribution and a histogram



- Interpreting a histogram
- Introduction to interpreting a pictograph
- Interpreting a pictograph table
- Interpreting a stem-and-leaf plot
- Constructing a stem-and-leaf plot NEW
- Constructing a scatter plot
- Sketching the line of best fit
- Scatter plots and correlation
- Predictions from the line of best fit
- Approximating the equation of a line of best fit and making predictions
- Using technology to fit a linear regression model to data and to make a prediction NEW
- Classifying linear and nonlinear relationships from scatter plots
- Linear relationship and the correlation coefficient
- Using technology to calculate the correlation coefficients for two sets of bivariate data to compare the linear relationships NEW
- Identifying outliers and clustering in scatter plots
- Identifying correlation and causation NEW
- Mean of a data set
- Using a model to find the mean
- Understanding the mean graphically: Two bars
- Understanding the mean graphically: Four or more bars
- Computations involving the mean, sample size, and sum of a data set
- Finding the value for a new score that will yield a given mean
- Rejecting unreasonable claims based on average statistics
- Weighted mean
- How changing a value affects the mean and median
- Mode of a data set
- Interpreting a percent bar graph to summarize categorical data using the mode NEW
- Choosing the best measure to describe data
- Finding the mode and range from a line plot
- How changing a value affects the range and IQR
- Identifying peaks, symmetry, gaps, and clusters in a line plot
- Identifying the center, spread, and shape of a data set
- Comparing measures of center and variation
- Using back-to-back stem-and-leaf plots to compare data sets
- Five-number summary and interquartile range
- Constructing a box-and-whisker plot
- Computing mean absolute deviation from a bar graph
- Finding outliers in a data set
- Introduction to the counting principle
- Counting principle
- Counting principle with repetition allowed
- Factorial expressions
- Computing permutations and combinations
- Word problem involving permutations
- Word problem involving combinations
- Introduction to permutations and combinations
- Finding the odds in favor and against
- Converting between probability and odds
- Area as probability
- Probabilities of a permutation and a combination
- Generating random samples from a population with known characteristics
- Using a random number table to make a fair decision

**\*Other Topics Available** By default, these topics are NOT included in the course, but can be added using the content editor in the Teacher Module.