Curriculum & Instruction

SUMMIT PUBLIC SCHOOLS

Content Area: Mathematics
Course: Math 6 (MA601)
Grade(s): 6

Course Overview

Emphasis on the development of problem solving and thinking skills, in compliance with th New Jersey Student Learning Standards. Instruction focuses on strengthening verbal and written communication, reasoning, and application of terminology and symbolism. The use of calculators and computers is encouraged within appropriate units of study. Math 6 is intended for students who demonstrate a basic understanding of computational skills and are working to develop a strong problem-solving ability. In addition to extending whole number, fraction, and decimal skills, students work with positive and negative numbers, ratio and proportion, percent, algebraic equations, and geometry.

Prerequisite: Math 5

New Jersey State Learning Standards

Summit Public Schools curriculum aligns with the New Jersey Student Learning Standards,

Content Area Standards:

- 6.EE.A.1. Write and evaluate numerical expressions involving whole-number exponents.
- 6.EE.A.2. Write, read, and evaluate expressions in which letters stand for numbers.
    - a. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as 5 – y
    - b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.
    - c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s3 and A = 6s2 to find the volume and surface area of a cube with sides of length s = 1/2.
- 6.EE.A.3. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the

equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.

- 6.EE.A.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.
- 6.EE.B.5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
- 6.EE.B.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
- 6.EE.B.7. Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.
- 6.EE.B.8. Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
- 6.EE.C.9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.
- 6.G.A.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
- 6.G.A.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = B h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
- 6.G.A.3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
- 6.G.A.4. Represent three-dimensional figures (e.g., pyramid, triangular prism, rectangular prism) using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
- 6.NS.A.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual

fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc). How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4- cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?

- 6.NS.B.2. With accuracy and efficiency, divide multi-digit numbers using the standard algorithm.
- 6.NS.B.3. With accuracy and efficiency, add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- 6.NS.B.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).
- 6.NS.C.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
- 6.NS.C.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
    - a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.
    - b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
    - c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
- 6.NS.C.7. Understand ordering and absolute value of rational numbers.
    - a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.
    - b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3◦C > –7◦C to express the fact that –3◦C is warmer than –7 ◦C.
    - c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a realworld situation. For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.
    - d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.

- 6.NS.C.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
- 6.RP.A.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
- 6.RP.A.2. Understand the concept of a unit rate a/b associated with a ratio a:b with b $\neq$0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."
- 6.RP.A.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
    - a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
    - b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?
    - c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
    - d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
- 6.SP.A.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.
- 6.SP.A.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- 6.SP.A.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
- 6.SP.B.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- 6.SP.B.5. Summarize numerical data sets in relation to their context, such as by:
    - a. Reporting the number of observations.
    - b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
    - c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
    - d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

- 7.NS.A.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
    - a. Describe situations in which opposite quantities combine to make 0. For example, in the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?
    - b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
    - c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
    - d. Apply properties of operations as strategies to add and subtract rational numbers.
- 7.NS.A.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
    - a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts
    - b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real world contexts.
    - c. Apply properties of operations as strategies to multiply and divide rational numbers.
    - d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
- 7.NS.A.3. Solve real-world and mathematical problems involving the four operations with rational numbers.

Interdisciplinary Standards:

- MS-PSI-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
- MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
- MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
- MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- MS-LS4-1. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
- MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

- MS-ESSI-3. Analyze and interpret data to determine scale properties of objects in the solar system.
- MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
- MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
- MS-ETSI-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Career Readiness, Life Literacies and Key Skills Standards:

- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- 9.4.8.CI.3: Examine challenges that may exist in the adoption of new ideas
- 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option
- 9.4.8.DC.7: Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys.
- 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping
- 9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations.
- 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data
- 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
- 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem

Computer Science and Design Thinking Standards:

- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.

Career Readiness Practices

- CRP 1. Act as a responsible and contributing citizen and employee.
- CRP 2. Apply appropriate academic and technical skills.
- CRP 3. Attend to personal health and financial well-being.
- CRP 4. Communicate clearly and effectively and with reason.
- CRP 5. Consider the environmental, social and economic impacts of decisions.
- CRP 6. Demonstrate creativity and innovation.
- CRP 7. Employ valid and reliable research strategies.
- CRP 8. Utilize critical thinking to make sense of problems and persevere in solving them.

- CRP 9. Model integrity, ethical leadership and effective management.
- CRP 10. Plan education and career paths aligned to personal goals.
- CRP 11. Use technology to enhance productivity.
- CRP 12. Work productively in teams while using cultural global competence.

New Jersey Curriculum Mandates:

This curriculum integrates lessons that address the following interdisciplinary New Jersey Curriculum Mandates:

- Diversity and Inclusion (Grades K - 12)
    - C.18A:35-4.36a: Curriculum to include instruction on diversity and inclusion.
        - (3) encourage safe, welcoming, and inclusive environments for all students regardless of race or ethnicity, sexual and gender identities, mental and physical disabilities, and religious beliefs.

Learning Objectives

Learning objectives are clear, specific statements that define what students should know, understand, and be able to do by the end of a lesson or course.

Students will understand how to…

- write products of repeated factors as powers.
- evaluate powers.
- explain why there is a need for a standard order of operations.
- evaluate numerical expressions involving several operations, exponents, and grouping symbols.
- write numerical expressions involving exponents to represent a real life problem.
- find factor pairs of a number.
- explain the meanings of prime and composite numbers.
- create a factor tree to find the prime factors of a number.
- write the prime factorization of a number.
- explain the meaning of factors of a number.
- use lists of factors to identify the greatest common factor of numbers.
- use prime factors to identify the greatest common factor of numbers.
- explain the meaning of multiples of a number.
- use lists of multiples to identify the least common multiple of numbers.
- use prime factors to identify the least common multiple of numbers.
- draw a model to explain fraction multiplication.
- multiply fractions and mixed numbers.
- interpret products involving fractions and mixed numbers to solve real-life problems.
- draw a model to explain division of fractions.
- find reciprocals of numbers.
- divide fractions by fractions and by whole numbers divide whole numbers by fractions.
- draw a model to explain division of mixed numbers.
- write a mixed number as an improper fraction.
- divide with mixed numbers.

- evaluate expressions involving mixed numbers using the order of operations.
- explain why it is necessary to line up the decimal points when adding and subtracting decimals.
- add and subtract decimals.
- evaluate expressions involving addition and subtraction of decimals.
- multiply decimals by whole numbers and by decimals.
- evaluate expressions involving multiplication of decimals.
- I can use long division to divide whole numbers.
- write a number as a fraction.
- interpret quotients in real-life problems.
- divide decimals by whole numbers and by decimals.
- divide whole numbers by decimals.
- write and interpret ratios using appropriate notation and language.
- recognize multiplicative relationships in ratios.
- describe how to determine whether ratios are equivalent and name ratios equivalent to a given ratio.
- Draw tape diagrams to model ratio relationships and interpret tape diagrams that represent ratio relationships.
- use tape diagrams to solve ratio problems.
- use various operations to create tables of equivalent ratios.
- use ratio tables to solve ratio problems and compare ratios.
- create and plot ordered pairs from a ratio relationship.
- create graphs to solve ratio problems and compare ratios.
- find and use unit rates to solve rate problems and compare rates.
- use unit rates to solve rate problems and compare rates.
- write conversion facts as unit rates.
- convert units of measure using ratio tables and conversion factors.
- convert rates using conversion factors.
- draw models to represent fractions and percents.
- write percents as fractions and fractions as percents.
- explain why the decimal point moves when multiplying and dividing by 100.
- write percents as decimals and decimals as percents.
- rewrite a group of fractions, decimals, and percents using the same representation.
- explain how to compare fractions, decimals, and percents.
- order fractions, decimals, and percents from least to greatest.
- Represent and find percents of numbers using an equation, a ratio table, or a model.
- find the whole given a part and the percent.
- identify parts of an algebraic expression.
- evaluate algebraic expressions with one or more variables and/or operations.
- write numerical and algebraic expressions.
- write and evaluate algebraic expressions that represent real-life problems.
- explain the meaning of equivalent expressions.
- use properties of addition and multiplication to generate equivalent expressions.
- explain how to apply the Distributive Property.
- identify the greatest common factor of terms including variables.
- use the Distributive Property to simplify algebraic expressions. (combine like terms, factor numerical expressions, factor algebraic expressions, etc…)

- interpret factored expressions in real-life problems.
- identify key words and phrases that indicate equality.
- write word sentences as equations.
- create equations to represent real life problems.
- determine whether a value is a solution of an equation.
- apply the Addition, Subtraction, Multiplication and Division Properties of Equality to generate equivalent equations.
- solve equations using addition, subtraction, multiplication or division.
- create equations involving addition, subtraction, multiplication or division to solve real-life problems.
- determine whether an ordered pair is a solution of an equation in two variables.
- distinguish between independent and dependent variables.
- write and graph an equation in two variables.
- create equations in two variables to solve real-life problems.
- explain how the area of a rectangle is used to find the area of a parallelogram.
- explain how the area of a parallelogram is used to find the area of a triangle and a trapezoid.
- use the base and the height of a parallelogram and triangle to find its area.
- use the area of a parallelogram and triangle and one of its dimensions to find the other dimension.
- use decomposition to find the area of a figure.
- decompose trapezoids and kites into smaller shapes.
- use the bases and the height of a trapezoid to find its area.
- draw nets to represent pyramids and prisms.
- use nets to find surface areas of pyramids and prisms.
- use a formula to find the surface area of a cube.
- apply surface areas of pyramids and prisms to solve real-life problems.
- use a formula to find the volume of a rectangular prism and a cube.
- use the volume of a rectangular prism and two of its dimensions to find the other dimension.
- apply volumes of rectangular prisms to solve real-life problems.
- find the numbers of faces, edges, and vertices of a three-dimensional figure.
- draw prisms and pyramids.
- draw the front, side, and top views of a three-dimensional figure.
- write integers to represent quantities in real life.
- explain the meaning of a rational number.
- graph integers and rational numbers on a number line.
- find the opposite of an integer.
- apply integers to model real-life problems.
- explain how to determine which of two integers is greater.
- determine which of two rational numbers is greater.
- order a set of integers and rational numbers from least to greatest.
- interpret statements about order in real-life problems.
- find the absolute value of a number.
- make comparisons that involve absolute values of numbers.
- apply absolute value in real-life problems.
- identify ordered pairs in a coordinate plane
- plot ordered pairs in a coordinate plane and describe their locations.

- reflect points in the x-axis, the y-axis, or both axes.
- apply plotting points in all four quadrants to solve real-life problems
- draw polygons in the coordinate plane.
- find distances between points in the coordinate plane with the same x-coordinates or the same y-coordinates.
- find horizontal and vertical side lengths of polygons in the coordinate plane.
- draw polygons in the coordinate plane to solve real-life problems.
- write word sentences as inequalities.
- determine whether a value is a solution to an inequality.
- graph the solutions of inequalities.
- apply the properties of inequality to generate equivalent inequalities.
- solve inequalities using addition, subtraction, multiplication or division.
- write and solve inequalities that represent real-life problems
- recognize questions that anticipate a variety of answers.
- construct and interpret a dot plot.
- use data to answer a statistical question.
- explain how the mean summarizes a data set with a single number.
- find the mean of a data set and use it to answer a statistical question.
- explain how the median and mode summarize a data set with a single number.
- find the median and mode of a data set.
- explain how changes to a data set affect the measures of center.
- use a measure of center to answer a statistical question
- explain how the range and interquartile range describe the variability of a data set with a single number.
- find the range and interquartile range of a data set.
- use the interquartile range to identify outliers.
- explain how the mean absolute deviation describes the variability of a data set with a single number.
- find the mean absolute deviation of a data set.
- compare data sets using the mean absolute deviation to draw conclusions.
- explain how to choose stems and leaves of a data set.
- make and interpret a stem-and-leaf plot and use it to describe the distribution of a data set.
- explain how to draw a histogram.
- make and interpret a histogram and use it to determine whether a question can be answered using a histogram.
- explain what it means for a distribution to be skewed left, skewed right, or symmetric.
- use data displays to describe shapes of distributions.
- use shapes of distributions to compare data sets.
- use the shape of a distribution to determine which measure of center and which measure of variation best describes the data.
- find the five-number summary of a data set.
- make a box-and-whisker plot.
- explain what the box and the whiskers of a box-and-whisker plot represent.
- compare data sets represented by box-and-whisker plots.
- graph rational numbers on a number line.
- find the absolute value of a rational number.
- use a number line to compare rational numbers.

- explain how to model addition of integers and rational numbers on a number line.
- find sums of integers and rational numbers by reasoning about absolute values.
- explain why the sum of a number and its opposite is 0.
- use properties of addition to efficiently add rational numbers.
- explain how subtracting integers is related to adding integers.
- explain how to model subtraction of integers and rational numbers on a number line.
- find differences of integers and rational numbers by reasoning about absolute values
- find distances between numbers on a number line.
- explain the rules for multiplying and dividing integers and rational numbers.
- find products of integers and rational numbers with the same and different sign(s).
- find quotients of integers and rational numbers with the same and different sign(s).
- explain the difference between terminating and repeating decimals.
- write fractions and mixed numbers as decimals.
- write decimals as fractions and mixed numbers.

Units of Study

Units of study are organized collections of lessons and learning experiences focused on a specific topic and set of skills within a course. Each unit is guided by a set of essential questions.

Unit 1: Numerical Expressions and Factors (~11 Days) - Chapter 1

- How do you know which operation to choose when solving a real-life problem?
- How can you use repeated factors in real-life situations?
- What is the effect of inserting parentheses into a numerical expression?
- Without dividing, how can you tell if a number is divisible by another number?
- How can you find the greatest common factor of two or more numbers?
- How can you find the least common multiple of two or more numbers?

Unit 2: Fractions & Decimals (~17 Days) - Chapter 2

- What does it mean to multiply fractions?
- How can you divide by a fraction?
- How can you divide by a mixed number?
- How can you add and subtract decimals?
- How can you multiply decimals?
- How can you divide decimals?

Unit 3: Ratios and Rates (~17 Days) - Chapter 3

- How can you represent a relationship between two quantities?
- How can you find two ratios that describe the same relationship?
- How can you use rates to describe changes in real-life problems?
- How can you compare two ratios?
- How can you use mental math to find the percent of a number?
- How can you compare lengths between the customary and metric systems?

Unit 4: Algebraic Expressions and Properties (~14 Days) - Chapter 5

- How can you write and evaluate an expression that models real-life?
- How can you write an expression that represents an unknown quantity?

- How do you evaluate algebraic expressions?
- Does the order in which you perform an operation matter?
- How do number properties help you to write equivalent expressions?
- How do you use number properties to simplify algebraic expressions?

Unit 5: Equations (~14 Days) - Chapter 6
- How does rewriting a word problem help you solve the word problem?
- How can you use addition or subtraction to solve an equation?
- How can you use multiplication or division to solve an equation?
- How can you write an equation in two variables?

Unit 6: Percents (~13 Days) - Chapter 4
- What is the connection between ratios, fractions, decimals and percents?
- How can you write a fraction as a percent?
- How can you write a decimal as a percent?
- How can you write a percent as a fraction?
- How can you write a percent as a decimal?
- How can you compare two rational numbers?
- How can you order a list of rational numbers?
- How can you find the whole when given a part of a percent?
- How can you find the part when given the whole and the percent equivalent?

Unit 7: Area, Surface Area, and Volume (~21 Days) - Chapter 7
- How can you derive a formula for the area of a parallelogram?
- How can you derive a formula for the area of a triangle?
- How can you derive a formula for the area of a trapezoid?
- How can you find the area of composite figures?
- How do you find a missing dimension for a polygon when given the area and at least one other dimension?
- How can you apply area to solve real-life problems?
- How can you draw three-dimensional figures?
- How can you find the area of the entire surface of a prism or pyramid?
- How can you use a net to find the surface area of a prism or pyramid?
- How can you find the volume of a rectangular prism with fractions edge lengths?
- How can you find the volume of a prism?
- How can you apply surface area and volume to solve real-life problems?

Unit 8: Integers, Number Lines, and the Coordinate Plane (~16 Days) - Chapter 8
- How can you represent numbers that are less than 0?
- How can you use a number line to order real-life events?
- How can you use a number line to compare positive and negative fractions and decimals?
- How can you describe how far an object is from 0?
- How can you graph and locate points that contain negative numbers in a coordinate plane?
- How can you describe the location of a point reflected over the x-axis, y-axis, or both axes?
- How can you find the distance between two points on the coordinate plane given the same x-coordinate or the same y-coordinate?
- How can you graph a polygon on the coordinate plane to solve real-life problems?

- How can you write word sentences as inequalities?
- How can you use a number line to represent solution of an inequality?
- How can you use addition or subtraction to solve an inequality?
- How can you use multiplication or division to solve an inequality?
- How can you write and solve inequalities that represent real-life problems?

Unit 9: Statistical Measures (~13 Days) - Chapter 9

- How can you tell whether a question is a statistical question?
- How can you find an average value of a data set?
- In what other ways can you describe an average of a data set?
- How can you describe the spread of a data set?
- How can you explain how the range and interquartile range describe the variability of a data set?
- How can you find the range and interquartile range of a data set?
- How can you use the distances between each data value and the mean of a data set to measure the spread of a data set?
- How can you make conclusions when comparing the mean absolute deviation of two data sets?

Unit 10: Data Displays (~10 Days) - Chapter 10

- How can you use place values to represent data graphically?
- How can you use intervals, tables, and graphs to organize data?
- How can you describe the shape of the distribution of a data set?
- How can you use quartiles to represent data graphically?
- How can you use shape of distribution to compare
- data sets?
- How can you use shape of distribution to determine which measure of center and which measure of variation best describes a set of data

ADDITIONAL TOPICS: INTEGER OPERATIONS

Unit A: Adding and Subtracting Rational Numbers (~6 Days) - Chapter A

- What are rational numbers, and how do they combine whole numbers and fractions?
- What strategies can we use to add and subtract rational numbers?
- How can visual representations, like number lines and models, enhance our grasp of adding and subtracting rational numbers?
- How can we make estimates when working with rational numbers?
- Why are rational numbers important in everyday life and other subjects?

Unit B: Multiplying and Dividing Rational Numbers (~8 Days) Chapter B

- What strategies can we use to multiply and divide rational numbers?
- How can visual representations, like area models and fraction bars, enhance our grasp of multiplying and dividing rational numbers?
- How can we make estimates when working with rational numbers?
- Why are rational numbers important in everyday life and other subjects?
- Can you explain how the concept of reciprocals or “flipping” numbers helps in dividing rational numbers?

Instructional Resources and Materials

Instructional resources are the information sources teachers utilize to guide their teaching and assessing. Instructional materials are the texts students read or review. The instructional resources and materials may vary in order to meet the learning needs of students.

- Guided Note Outlines
- Google Classroom
- DeltaMath
- Desmos
- Khan Academy
- NJ Standardized Test Prep Resources
- Kuta Software
- Textbook Resource: Big Ideas Math

Assessment Strategies

Assessment measures a student's mastery of a course standard and learning objective. Assessment can be used for both instructional purposes and for evaluative purposes. Teachers may choose one or more of the following ideas to assess learners. They may also modify these ideas to make the assessment more responsive to students' interests and needs.

Formative: Practice Problem Sets, Homework Exercises, Exit Tickets, Graded Check-Ins

Summative: Quizzes & Unit Tests

Benchmark: Midterm and Final Exams

Alternative: Projects

Suggested Strategies for Modification & Differentiation

Modifications Chart