**Cartersville Middle School Curriculum Map** **Grade Level/Subject Area:** 6th Grade Math

| | Unit 1: Making Relevant Connections through Number System Fluency | Unit 2: Rational Explorations: Numbers and their Opposites and Graphing Rational Numbers | Unit 3: Investigating Rate, Ratio, and Proportional Reasoning | Unit 4: Building Conceptual Understanding of Expressions |
|---|---|---|---|---|
| **Estimated Teaching Time** | **3-4 weeks** | **3-4 weeks** | **3-4 weeks** | **2-3 weeks** |
| **Essential Standard(s)** | **6.NR.1.2** Multiply and divide any combination of whole numbers, fractions, and mixed numbers using a student-selected strategy. Interpret products and quotients of fractions and solve word problems.<br><br>**6.PAR.6.2** Determine the greatest common factors and least common multiples using a variety of strategies to make sense of applicable problems. | **6.NR.3.1** Identify and compare integers and explain the meaning of zero based on multiple authentic situations.<br><br>**6.NR.3.2** Order and plot integers on a number line and use distance from zero to discover the connection between integers and their opposites.<br><br>**6.NR.3.3** Recognize and explain that opposite signs of integers indicate locations on opposite sides of zero on the number line; recognize and explain that the opposite of the opposite of a number is the number itself.<br><br>**6.NR.3.5** Explain the absolute value of a rational number as its distance from zero on the number line; interpret absolute value as distance for a positive or negative quantity in a relevant situation. | **6.NR.4.3** Solve problems involving proportions using a variety of student-selected strategies.<br><br>**6.NR.4.5** Solve unit rate problems including those involving unit pricing and constant speed. | **6.PAR.6.1** Write and evaluate numerical expressions involving rational bases and whole-number exponents. |
| **Learning Targets for Essential Standard(s)** | **6.NR.1.2**<br>• Interpret what the quotient represents in mathematical and real-world problems. | • Understand that zero represents a position on the numberline | **6.NR.4.3**<br>• Identify equivalent ratios.<br>• Create a table using equivalent ratios. | **6.PAR.6.1:**<br>• Evaluate expressions for given values of variables using the order of operations when |

| | | | | |
|---|---|---|---|---|
| | • Understand that multiplication and division are inverse operations.<br>• Divide fractions procedurally using the multiplicative inverse.<br><br>**6.PAR.6.2**<br>• Using numbers 1-100, understand what a factor is (a whole number that divides without a remainder into another number).<br>• Using numbers less than or equal to 12, understand what a multiple is (a whole number that is a product of two factors).<br>• Calculate greatest common factor using multiple methods.<br>• Calculate least common multiple using multiple methods.<br>• Using the distributive property, to decompose numbers into a common factor times a sum.<br>• Solve real-world problems utilizing greatest common factor and least common multiple. | and that every negative integer is less than zero.<br>• Understand the meaning of zero on a number line and in different real world situations.<br>• Use positive and negative numbers to represent quantities in the real world (ex. temperatures above and below zero).<br>• Represent real world scenarios using integers (bank accounts, temperature, and sea level). | • Find missing values of a table using equivalent ratios.<br>• Plot pairs of values on a coordinate plane.<br>• Create and solve real-world ratio problems.<br>• Understanding the meaning of unit pricing and constant speed.<br>• Solve unit rate problems using tape diagrams or double number line diagrams.<br>• Explain how ratio and percent are related.<br>• Know that percents are a special rate where a part is compared to a whole and the whole always has a value of 100.<br>• Write a percent as a rate over 100 including percents greater than 100 and less than 1.<br>• Represent the relationship of part to a whole to describe percents using models.<br>• Solve problems involving finding the whole, given a part and the percent.<br>• Convert units using multiplication and division.<br>• Convert measurement units using ratio reasoning within customary units and within metric units.<br>• Convert measurement | appropriate.<br>• Evaluate expressions that arise from formulas used in real-world problems.<br>• Represent exponents as repeated multiplication.<br>• Write numbers using exponents and write numerical expressions using exponents.<br>• Calculate the value of numbers written in exponential form.<br>• Evaluate numerical expressions containing whole number exponents.<br>• Discovering any base to power of 0 is 1. |

| | | | | |
|---|---|---|---|---|
| | | | units using ratio reasoning between customary units and metric units. | |
| **Supporting Standards** | **6.NR.1.1** Fluently add and subtract any combination of fractions to solve problems<br><br>**6.NR.1.3** Perform operations with multi-digit decimal numbers fluently using models and student-selected strategies. | **6.NR.3.4** Write, interpret, and explain statements of order for rational numbers in authentic, mathematical situations. Compare rational numbers, including integers, using equality and inequality symbols.<br><br>**6.NR.3.6** Distinguish comparisons of absolute value from statements about order.<br><br>**6.NR.2.3** Interpret numerical data to answer a statistical investigative question created. Describe the distribution of a quantitative (numerical) variable collected, including its center, variability, and overall shape.<br><br>**6.NR.2.4** Design simple experiments and collect data. Use data gathered from realistic scenarios and simulations to determine quantitative measures of center (median and/or mean) and variability (interquartile range and range). Use these quantities to draw conclusions about the data, compare different numerical | **6.NR.4.1** Explain the concept of a ratio, represent ratios, and use ratio language to describe a relationship between two quantities.<br><br>**6.NR.4.2** 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.<br><br>**6.NR.4.4** Describe the concept of rates and unit rate in the context of a ratio relationship.<br><br>6.**NR.4.6** Calculate a percent of a quantity as a rate per 100 and solve everyday problems given a percent.<br><br>**6.NR.4.7** Use ratios to convert within measurement systems (customary and metric) to solve authentic problems that exist in everyday life. | **6.PAR.6.2** Determine greatest common factors and least common multiples using a variety of strategies to make sense of applicable problems.<br><br>**6.PAR.6.3** Write and read expressions that represent operations with numbers and variables in realistic situations.<br><br>**6.PAR.6.4** Evaluate expressions when given values for the variables, including expressions that arise in everyday situations.<br><br>**6.PAR.6.5** Apply the properties of operations to identify and generate equivalent expressions |

| | | | | |
|---|---|---|---|---|
| | | data sets, and make predictions.<br><br>**6.PAR.8.1**<br>Locate and position rational numbers on a horizontal or vertical number line; find and position pairs of integers and other rational numbers on a coordinate plane.<br><br>**6.PAR.8.2** Show and explain that signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane and determine how two ordered pairs may differ based only on the signs.<br><br>**6.PAR.8.3** Solve 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 x-coordinate or the same y-coordinate.<br><br>**6.PAR.8.4** 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 x-coordinate or the same y-coordinate. | | |

| | | | | |
|---|---|---|---|---|
| | | | | |
| **Learning Targets for Supporting Standards** | **MGSE6.NS.2**<br>• Understand place value of multi-digit numbers and use it when dividing.<br>• Apply the rules of division to solve multi-digit problems.<br>• Know that division is the inverse of multiplication.<br>• Use compatible numbers to estimate the reasonableness of answers. | • Use vertical and horizontal number lines to show integers.<br>• Understand the meaning of the term opposite and plot opposites on a number line.<br>• Reason that the opposite of the opposite of the number is the number itself (e.g., -(-3)), and | **MGSE6.RP.1**<br>• Identify a ratio.<br>• Describe a ratio between quantities.<br>• Explain a ratio by drawing a picture.<br>• Write a ratio in different forms (fraction, colon, word form).<br>• Compare two quantities using a ratio.<br>• Explain that a ratio is a fraction which is also a | **6.PAR.6.3**<br>• Recognize that variables represent unknown quantities.<br>• Translate verbal expressions into into numerical expressions and numerical expressions into verbal expressions<br>**6.PAR.6.3**<br>• Identify the parts of an algebraic expression using mathematical terms (sum, |

| | | | | |
|---|---|---|---|---|
| | • Relate division to repeated subtraction.<br>• Develop fluency with the standard algorithm for division of multi-digit whole numbers.<br><br>**MGSE6.NS.3**<br>• Understand decimal place value.<br>• Fluently add, subtract, multiply and divide multi-digit decimal numbers.<br>• Recall estimation strategies for adding, subtracting, multiplying and dividing decimals. | zero is its own opposite.<br>• Describe quantities having opposite value.<br><br>• Understand that the signs of numbers in ordered pairs represents a singular location on the coordinate plane.<br>• Understand that an ordered pair is composed of two parts: The first coordinate refers to the x-axis, and the second coordinate refers to the y-axis.<br>• Recognize the signs of all ordered pairs on the coordinate plane: Quadrant I (+, +); Quadrant II (-, +); Quadrant III (- , -); Quadrant IV (+, -).<br>• Discover that changing the sign of one or both numbers in the ordered pair will create a reflection of the point.<br>• Find reflections of points across both axes. | division problem.<br>• Use tape diagrams or a double number line diagrams to model a unit rate.<br>• Interpret a rate from tape diagrams and double number line diagrams.<br>• Write a ratio using letters a:b, a/b, a to b – where b is not equal to 0 according to the definition of ratio.<br><br>**MGSE6.RP.2**<br>• Define and explain what a unit rate is.<br>• Calculate a unit rate.<br>• Understand rate as a ratio that compares two quantities with different units of measure.<br>• Understand that unit rates compare two quantities with different units of measure, where the second term means "one" like 60 miles per one hour).<br>• Interpret rate language with the @ symbol and with the words per, each, etc. | term, product, factor, quotient, coefficient).<br>• View one or more parts of an expression as a single entity.<br>• Recognize that mathematical symbols represent mathematical operations.<br><br>**6.PAR.6.5**<br>• Know what each of the following 7 Properties of Operations are: Associative, Commutative, & Identity Properties of Addition & Multiplication, and the Distributive Property.<br>• Apply the Properties of operations to generate equivalent expressions.<br>• Understand that the properties used with numbers also apply to expressions with variables.<br><br>**6.PAR.6.4**<br>• Determine when two expressions are equivalent.<br>• Use substitution to create equivalent expressions.<br>• Combining like terms in expressions accurately. |

| | | | | |
|---|---|---|---|---|
| | | • Plot coordinates in all four quadrants of a coordinate plane.<br>• Plot integers and other rational numbers on a number line (vertically and horizontally) and on a coordinate plane.<br>• Find the position of integer pairs and other rational numbers (including fractions and decimals) on a coordinate plane.<br><br>• Order rational numbers on a number line.<br>• Compare rational numbers using inequality symbols and justify the inequality symbol used.<br>• Order rational numbers on a number line.<br>• Compare integers using inequality symbols and justify the inequality symbol used.<br><br>• Write an inequality to show the relationship between rational | | |

| | | | | |
|---|---|---|---|---|
| | | numbers in real-world situations.<br>• Explain statements of order for rational numbers in real-world contexts.<br><br>• Define, identify and understand absolute value as the distance from zero on the number line.<br>• Recognize the symbol \| \| as representing absolute value.<br>• Use absolute value to represent the size, amount, distance, or magnitude in real-world applications..<br>• Model absolute value with number lines.<br><br>• Explain that as the value of a negative rational number decreases, its absolute value (distance from zero) increases.<br>• Develop understanding of absolute values within real-world contexts. | | |

| | | | | |
|---|---|---|---|---|
| | | • Graph points in all four quadrants of the coordinate plane.<br>• Solve real-world mathematical problems by graphing points in all four quadrants of a plane (maps, shapes, pictures).<br>• Understand that a line segment from one coordinate pair to another represents a distance.<br>• Understand that if two coordinates have the same x- or y-value, they are on the same line.<br>• Understand that the distance from a point on a coordinate plane to an axis is an absolute value.<br>• Use the coordinate plane to represent real-world scenarios, such as streets of a map.<br>• Model solutions to real-world problems on a coordinate plane.<br><br>• Draw polygons on a coordinate plane given coordinates for the vertices.<br>• Discover how to find the length of sides of | | |

| | | | | |
|---|---|---|---|---|
| | | polygons using the coordinates of the vertices having the same first or second coordinate and generalize a technique that will always work.<br>• Determine the length of the sides of polygons, by counting, in a coordinate plane given the same first or second coordinate. | | |

| | **Unit 5: Exploring Real-life Phenomena through One-Step Equations and Inequalities** | **Unit 6: Exploring Area and Volume** | **Unit 7: Exploring Real-Life Phenomena through Statistics** | **Unit 8: Culminating Capstone Unit (applying concepts in real-life contexts in a culminating interdisciplinary unit)** |
|---|---|---|---|---|
| **Estimated Teaching Time** | **4-5 weeks** | **4-5 weeks** | **4-5 weeks** | **3-4 weeks** |
| **Essential Standard(s)** | **6.PAR.7**: Write and solve one-step equations and inequalities as mathematical models to explain authentic, realistic situations. | **6.GSR.5.3** Calculate the volume of right rectangular prisms with fractional edge lengths by applying the formula, V = (area of base) x (height). | **6.NR.2.5** Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. | All |
| **Learning Targets for Essential Standard(s)** | **6.PAR.7:**<br>• Solve real-world and mathematical | • Model volume by filling a rectangular prism with unit | • Determine the mean, median, mode, and range. | |

| | | | | |
|---|---|---|---|---|
| | 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. | cubes of fractional lengths and use the model to determine the volume of the prism.<br>• Discover that filling a prism with cubes and counting the number of cubes in the prism is the same as using the volume formula.<br>• Reason that finding the volume is the same process and uses the same formulas if the edge lengths are whole units or fractional units.<br>• Solve real-world problems where one of the edge lengths is a fractional unit. | • Model with examples the difference between measures of center and measures of spread.<br>• Determine appropriate center and variation for various data sets.<br>• Understand what is a statistical question and what is not. | |
| **Supporting Standards** | **6.PAR.7.2** Write one-step equations and inequalities to represent and solve problems; explain that a variable can represent an unknown number or any number in a specified set..<br><br>**6.PAR.7.3** Solve problems by writing and solving equations of the form x + p = q, px = q and x p = q for cases in which p, q and x are all nonnegative rational numbers.<br><br>**6.PAR.7.4** Recognize and generate inequalities of the form x > c, x > c, x < c, or x < c to explain situations that have infinitely many solutions; represent solutions of such inequalities on a | **6.GSR.5.1** Explore area as a measurable attribute of triangles, quadrilaterals, and other polygons conceptually by composing or decomposing into rectangles, triangles, and other shapes. Find the area of these geometric figures to solve problems.<br><br>**6.GSR.5.2** Given the net of three-dimensional figures with rectangular and triangular faces, determine the surface area of these figures | **6.NR.2.3** Interpret numerical data to answer a statistical investigative question created. Describe the distribution of a quantitative (numerical) variable collected, including its center, variability, and overall shape.<br><br>**6.NR.2.2** Summarize categorical and quantitative (numerical) data sets in relation to the context: display the distributions of quantitative (numerical) data in plots on a number line, including dot plots, histograms, and box plots and display the distribution of categorical data using bar graphs.<br><br>**6.NR.2.4** Design simple experiments and collect data. Use data gathered from realistic scenarios and | |

| | | | | |
|---|---|---|---|---|
| | number line | | simulations to determine quantitative measures of center (median and/or mean) and variability (interquartile range and range). Use these quantities to draw conclusions about the data, compare different numerical data sets, and make predictions.<br><br>**6.NR.2.5** Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. | |
| **Learning Targets for Supporting Standards** | **6.PAR.7.1**<br>• Use precise mathematical vocabulary among expressions, equations, and inequalities.<br>• Solution(s) are values that make the equation or inequality true & they are found by using substitution.<br>• Understand that the solution to equations is a singular value that makes the equation true and solutions to inequalities is a range of values that make the inequality true.<br>• Use substitution as a method to reason which value(s) from a given set make the | • Apply the formulas to find the area of various polygons.<br>• Find the area of irregular polygons by composing and decomposing into rectangles and triangles and other shapes.<br>• Find areas of right, equilateral, isosceles, and scalene triangles, and special quadrilaterals.<br>• Model composition and decomposition of shapes using manipulatives.<br>• Solve problems from the real-world using composite figures to model real-world examples such as the size of a lake or a crater on the moon.<br><br>• Visualize how nets relate to three-dimensional figures.<br>• Understand how area of two- | • Identify the difference between statistical and nonstatistical questions.<br>• Formulate and write simple statistical questions that provide differences in responses.<br>• Recognize that statistical questions generate variability.<br><br>• Understand that data collected to answer a statistical questions can be analyzed by their distribution.<br>• Calculate median, mode, and range.<br>• Describe a data set using its center (mean, median and mode), spread (range), and overall shape.<br><br>• Represent given data on the most appropriate graph (dot | |

| | | | | |
|---|---|---|---|---|
| | equation or inequality true.<br><br>**6.PAR.7.1**<br>• Understand variables are letters or symbols that represent unknown numbers or a specified set of numbers.<br>• Represent real-world situations with variable expressions, identifying what the variable represents.<br><br>**6.PAR.7.4**<br>• Discover that a variable can represent an infinite number of solutions in inequalities.<br>• Graph inequalities on a number line.<br>• Write inequalities to solve real-world mathematical problems.<br>• Check by substitution to determine if the graph of an inequality is correct. | dimensional figures relates to surface area of three-dimensional figures.<br>• Use nets made up of rectangles and triangles to find the surface area of three-dimensional figures.<br>• Solve real-world and mathematical problems to determine the surface area of figures | plot, histogram, or box plot).<br>• Interpret data represented on dot plots, box plots, and histograms for given situations.<br><br>• Understand that observations are recorded as numerical or quantitative data.<br>• Create tables (including intervals), lists, plots, and histograms using data from recorded observations.<br>• Use data displays to answer questions about the data set.<br><br>• Identify how and why data was collected for investigation and if biased, random, or representative.<br>• Summarize numerical data sets in relation to how it was measured and its units of measurement.<br>• Label all parts of data display with appropriate units of measure.<br><br>• Use data to find the five-number summary and create box-and-whisker plot.<br>• Create, read, and interpret graphical representations of numerical data.<br>• Find the interquartile range and know that IQR is at 50% and not affected by outliers.<br>• Identify outliers.<br>• Understand how outliers affect the measures of central | |

| | | | | |
|---|---|---|---|---|
| | | | tendency.<br><br>• Identify which measure of center and variability best represents data set.<br>• Relate choice of measure in data to the context of its collection. | |