2022 - 2023, Sixth Grade, Mathematics

The following <u>Practice Standards</u> **and** <u>Literacy Skills</u> **will be used throughout the course:**

Standards for Mathematical Practice	Literacy Skills for Mathematical Proficiency
1. Make sense of problems and persevere in solving them.	1. Use multiple reading strategies.
2. Reason abstractly and quantitatively.	2. Understand and use correct mathematical vocabulary.
3. Construct viable arguments and critique the reasoning of others.	3. Discuss and articulate mathematical ideas.
4. Model with mathematics.	4. Write mathematical arguments.
5. Use appropriate tools strategically.	
6. Attend to precision.	
7. Look for and make use of structure.	
8. Look for and express regularity in repeated reasoning.	

Quarter 1

Standards	Evidence of Learning Statements from **Instructional Focus Document**
6.NS.B.2 Fluently divide multi-digit numbers using a standard algorithm.	Accurately, flexibly, and efficiently divide multi-digit whole numbers using a standard algorithm. Apply place value understanding to divide multi-digit whole numbers. Interpret the quotient and remainder in a multi-digit division problem. Represent the remainder of a multi digit division problem using a fraction or decimal.
6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using a standard algorithm for each operation.	Find a sum, difference, product, or quotient of multi-digit decimals flexibly, efficiently and accurately using a standard algorithm for each operation.
6.NS.A.1 Interpret and compute quotients of fractions, and solve contextual 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 lbs. of chocolate equally? How many 3/4-cup servings are in*	Compute the quotient of a fraction divided by a fraction. Solve contextual problems involving partitive and quotative division of fractions by fractions. Interpret solutions to contextual problems involving partitive and quotative division of fractions by fractions. Model both partitive and quotative division using visual fraction models.

Standards	Evidence of Learning Statements from **[Instructional Focus Document](#)**
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.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. **d.** Use ratio reasoning to convert customary and metric measurement units (within the same system); manipulate and transform units appropriately when multiplying or dividing quantities.	Use ratio reasoning to convert measurement units within the same system.
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).*	Rewrite the sum of two whole numbers using the GCF and distributive property. Determine the greatest common factor for two given whole numbers that are less than or equal to 100. Determine the least common multiple for two given whole numbers that are less than or equal to twelve.
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.* or *for every vote candidate A received, candidate C received nearly three votes.*	Use ratio language such as for each, or for every, to describe a ratio between two quantities. Express ratios in various forms including fraction notation, using a colon, using the word "to" or as a verbal expression.
6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0. 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.* or *We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger.* (Expectations for unit rates in 6th grade are limited to non-complex fractions).	Give a unit rate to represent a ratio embedded in a context. When given a context, use rate language to describe a ratio relationship.

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Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
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.	Solve real-world problems using ratio and rate reasoning using tables, tape diagrams, double number line diagrams, or equations. From context generate tables of equivalent ratios, find a missing number in the table, and use the table to plot the ratios on a coordinate graph. Use a table and graph to compare ratios.
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. **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?*	Solve unit rate problems, including those about unit pricing and constant speed.

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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.) **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.	Solve percent problems involving both finding a percent of a quantity and finding the whole.
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, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	Use integers to represent contextual situations involving quantities that have opposite directions or values. Explain the meaning of zero when used to represent quantities in real-world situations.
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. *For example, – (–3) = 3, and that 0 is its own opposite.*	Describe positive and negative numbers as indicating opposite directions relative to 0 on the number line and explain the meaning of 0 in mathematical contexts. Locate positive and negative rational numbers on a horizontal and vertical number line. Recognize the opposite of the opposite of a number as the number itself.
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. **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.	Describe positive and negative numbers as indicating opposite directions relative to 0 on the number line and explain the meaning of 0 in mathematical contexts. Locate positive and negative rational numbers on a horizontal and vertical number line. Recognize the opposite of the opposite of a number as the number itself. Identify and locate points described by ordered pairs of positive and

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	negative rational numbers on a coordinate plane.
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. **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.	Identify and locate points described by ordered pairs of positive and negative 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.*	Compare two rational numbers using >, <, and = symbols to record the results of comparisons.
6.NS.C.7 Understand ordering and absolute value of rational numbers. **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.*	Interpret statements of inequality as the comparison of two numbers on a number line diagram. Write, interpret, and explain statements of order for rational numbers in real-world contexts.
6.NS.C.7 Understand ordering and absolute value of rational numbers. **c.** Understand the absolute value of a rational number as its distance from 0 on the number line and distinguish comparisons of absolute value from statements about order in a real-world context. *For example,* an account balance of -24 dollars represents a greater debt than an account balance of -14 dollars because -24 is located to the left of -14 on the number line.	Compare and order absolute values of rational numbers. Use a number line to model the absolute value of a rational number showing that it represents the distance the number is from zero. Distinguish comparisons of absolute value from statements about order in a real-world context.
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	Find the distance between two points on the coordinate plane using absolute value when both points lie on the same horizontal or vertical

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
and absolute value to find distances between points with the same first coordinate or the same second coordinate.	line. Solve real-world and mathematical problems by graphing points on the coordinate plane.
6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.	Write numerical expressions that represent a real-world or mathematical context with whole number exponents and grouping symbols. Evaluate numerical expressions by applying the order of operations with whole-number exponents.
6.EE.A.2 Write, read, and evaluate expressions in which variables stand for numbers. **a.** Write expressions that record operations with numbers and with variables. *For example, express the calculation "Subtract y from 5" as 5 − y.*	Write expressions that record operations with numbers and with variables given a verbal expression written in words.
6.EE.A.2 Write, read, and evaluate expressions in which variables stand for numbers. **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.*	Identify and describe parts of an expression using appropriate mathematical vocabulary.
6.EE.A.2 Write, read, and evaluate expressions in which variables stand for numbers. **c.** Evaluate expressions at specific values for their variables. Include expressions that arise from formulas in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify an	Evaluate algebraic expressions involving positive rational numbers with whole-number exponents using properties of operations and order of operations. Substitute for the unknown (variable), when given a specific numerical value, to evaluate expressions including those that arise from formulas used in real-world problems.

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
order (Order of Operations).	
6.EE.A.3 Apply the properties of operations (including, but not limited to, commutative, associative, and distributive properties) to generate equivalent expressions. The distributive property is prominent here. *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.*	Apply multiple properties of operations to rewrite an expression, generating an equivalent expression.
6.EE.A.4 Identify when expressions are equivalent (i.e., when the expressions name the same number regardless of which value is substituted into them). *For example, the expression 5b + 3b = (5 + 3)b, which is equivalent to 8b.*	Choose multiple equivalent expressions when the simplification requires the application of multiple properties of operations. Generate equivalent expressions because of applying a single property of operations.
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.	Use variables to write expressions and solve real-world problems. Explain the meaning of a variable in an expression using precise mathematical vocabulary

Quarter 3

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
6.EE.B.5 Understand solving an equation or inequality is carried out by determining if any of the values from a given set make the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	Use substitution to determine if a value from a given set is the solution to an equation or inequality that contains variables.
6.EE.B.7 Solve real-world and mathematical problems by writing and solving one-step equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.	Solve real-world or mathematical problems by writing and solving equations of the form $x + p = q$ or $px = q$ when p, q, and x are all nonnegative rational numbers.
6.EE.B.8 Interpret and 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.	Write an inequality of the form $x > c$, $x < c$, $x > c$, or $x < c$ to represent a constraint or condition in a real-world or mathematical situation. Graph an inequality in the form $x > c$, $x < c$, $x > c$, or $x < c$ on a number line.
6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another. *For example, Susan is putting money in her savings account by depositing a set amount each week ($50). Represent her savings account balance with respect to the number of weekly deposits (s = 50w, illustrating the relationship between balance amount s and number of weeks w).* **a.** 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. **b**. Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the equation.	Write a two-variable equation in the form $y = x + p$ and $y = px$ to represent a real-world problem and then analyze the relationship between the variables using graphs and tables.
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; know and apply these techniques in the context of solving real-world and mathematical problems.	Find the area of triangles, quadrilaterals, and polygons that can be decomposed into parts utilizing common area formulas. Find the area of polygons embedded in real-world and mathematical

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	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 that joins two vertices (vertical or horizontal segments only). Know and apply these techniques in the context of solving real-world and mathematical problems.	Find the length of a side of a polygon when the coordinates of the vertices have the same first or second coordinate. Draw a polygon in the coordinate plane given a set of coordinates for the vertices and use the representation to solve real-world and mathematical problems

Quarter 4

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
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. Know and apply the formulas V = lwh and V = Bh where B is the area of the base to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	Find the volume of right rectangular prisms with fractional edge lengths to solve real-world and mathematical problems when a visual model is provided. Model the volume of a right rectangular prism where multiple sides have fractional edge lengths based on the same unit fraction by packing it with unit cubes with dimensions of the appropriate unit fraction.
6.G.A.4 Represent three-dimensional figures 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.	Identify the nets associated with three-dimensional figures composed of rectangles and triangles. Find the surface area of a three-dimensional figure given the net that represents that figure in the context of solving real-world and mathematical problems.
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.*	Distinguish between a statistical and a non-statistical question. Write statistical questions. Collect data to answer statistical questions.
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 (mean, median, mode), spread (range), and overall shape.	Use the mean, median, and mode to describe data that has been generated from a statistical question. Use the range to describe data that has been generated from a statistical question. Describe the overall shape of a data set with respect to its center.
6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes all its values with a single number, while a measure of variation describes how its values vary with a single number.	Recognize that a measure of center for a numerical data set summarizes all its values with a single number. Recognize that a measure of variation describes how its values vary with a single number.

Standards	Evidence of Learning Statements from Instructional Focus Document
	Distinguish between measures of center and measures of variation. Determine appropriate measures of center and variation for various data sets.
6.SP.B.4 Display a single set of numerical data using dot plots (line plots), box plots, pie charts, and stem plots.	Interpret data that is represented in a box plot, dot plot, and stem plot. Interpret data that is represented on a pie chart by relating each section to the whole circle. Create a box plot, and stem plot using a numerical set of data. Create a pie chart using a numerical set of data.
6.SP.B.5 Summarize numerical data sets in relation to their context. **a.** Report the number of observations.	Summarize data displays by describing overall patterns in a distribution. Analyze data displays to determine the attribute being measured, its unit of measurement and the number of observations.
6.SP.B.5 Summarize numerical data sets in relation to their context. **b**. Describe the nature of the attribute under investigation, including how it was measured and its units of measurement.	Analyze data displays to determine the attribute being measured, its unit of measurement and the number of observations.
6.SP.B.5 Summarize numerical data sets in relation to their context. **c.** Give quantitative measures of center (median and/or mean) and variability (range), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data was gathered.	Communicate appropriate measures of center and spread when describing a data set.
6.SP.B.5 Summarize numerical data sets in relation to their context. **d.** Relate the choice of measures of center to the shape of the data distribution and the context in which the data was gathered.	Summarize data using the mean, median and range considering the method used to collect the data.

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Embedded K-8 TN Computer Science Standards are found in the Resource Column

FCO.6 Select and use appropriate word processing, spreadsheets, and multimedia applications.

AIT.3 Determine the best technology and appropriate tool to address a variety of tasks and problems.

AIT.4 Use multiple processes and diverse perspectives to explore alternative solutions.

AIT.8 Identify that various algorithms can achieve the same result and determine the most efficient sequence.

ISA.8 Describe the rationale for various security measures when using technology.