2022 - 2023, Seventh Grade, Mathematics

The following Practice Standards and Literacy Skills will be used throughout the course:

Standards for Mathematical Practice
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
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.

Literacy Skills for Mathematical Proficiency
1. Use multiple reading strategies.
2. Understand and use correct mathematical vocabulary.
3. Discuss and articulate mathematical ideas.
4. Write mathematical arguments.

Quarter 1

Standards	Evidence of Learning Statements from **Instructional Focus Document**
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.	Generate a number line diagram that represents a given addition or subtraction problem of rational numbers. Add and subtract rational numbers. Explain that the sum p + q is located a distance |q| from p and when it goes in the negative direction and when it goes in the positive direction. Create a real-world context to represent a given sum or difference of rational numbers. Identify that the distance between two rational numbers on a number line is the absolute value of their difference.
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. **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.	Generate a number line diagram that represents a given addition or subtraction problem of rational numbers. Add and subtract rational numbers. Explain that the sum p + q is located a distance |q| from p and when it goes in the negative direction and when it goes in the positive direction.

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Standards	Evidence of Learning Statements from Instructional Focus Document
	Create a real-world context to represent a given sum or difference of rational numbers.
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. **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.	Generate a number line diagram that represents a given addition or subtraction problem of rational numbers. Add and subtract rational numbers. Create a real-world context to represent a given sum or difference of rational numbers. Identify that the distance between two rational numbers on a number line is the absolute value of their difference.
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. **d.** Apply properties of operations as strategies to add and subtract rational numbers.	Generate a number line diagram that represents a given addition or subtraction problem of rational numbers. Add and subtract rational numbers. Create a real-world context to represent a given sum or difference of rational numbers. Identify that the distance between two rational numbers on a number line is the absolute value of their difference.
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.	Multiply and divide a wide variety of rational numbers. Interpret products and quotients of rational numbers by describing real-world contexts. Create a real-world context to represent a given product or quotient of rational numbers.
7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **b.** Understand that integers can be divided, provided that the divisor is not	Multiply and divide a wide variety of rational numbers. Interpret products and quotients of rational numbers by describing real-world contexts.

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Standards	Evidence of Learning Statements from Instructional Focus Document
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.	Create a real-world context to represent a given product or quotient of rational numbers.
7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **c.** Apply properties of operations as strategies to multiply and divide rational numbers	Multiply and divide a wide variety of rational numbers. Interpret products and quotients of rational numbers by describing real-world contexts. Create a real-world context to represent a given product or quotient of rational numbers.
7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions 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.	Convert a rational number to a decimal using long division; know that the decimal form of rational numbers terminates or eventually repeats.
7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)	Solve multi-step real-world problems involving the four operations with rational numbers. Solve mathematical problems involving operations with complex fractions. Solve real-world problems involving operations with complex fractions. Apply the order of operations (including grouping symbols and exponents) to solve mathematical and real-world situations involving rational numbers.
7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction (1/2)/(1/4) miles per hour, equivalently 2 miles per hour.*	Write ratios to model situations involving fractional quantities measure in like or different units and use the ratio to determine a unit rate.
7.RP.A.2 Recognize and represent proportional relationships between quantities.	Given a verbal description or diagram, determine if the quantities are proportionally related.

Standards	Evidence of Learning Statements from Instructional Focus Document
a. Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	Given a context, generate a graph and use it to determine if quantities are proportionally related. Given a context, generate a table of values and use it to determine if quantities are proportionally related. Recognize that equations involving addition or subtracting, such as $y = kx + c$, are not proportional because there is not a constant that can be multiplied by x to get y.
7.RP.A.2 Recognize and represent proportional relationships between quantities. **b**. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	Identify the constant of proportionality (unit rate) from a wide variety of representations of a proportional relationship.

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Quarter 2

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
7.RP.A.2 Recognize and represent proportional relationships between quantities. **c.** Represent proportional relationships by equations. *For example, if total cost* t *is proportional to the number n of items purchased at a constant price* p*, the relationship between the total cost and the number of items can be expressed as t = pn.*	Given a context, write a two-variable equation (in the form of $y = kx$) to represent a proportional relationship. Given a table of equivalent ratios, write a two-variable equation (in the form of $y = kx$) to represent a proportional relationship. Use equations to solve problems involving proportional relationships.
7.RP.A.2 Recognize and represent proportional relationships between quantities. **d.** Explain what a point (*x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where r is the unit rate.	Interpret the meaning of any ordered pair on a graph in terms of the context.
7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error*.	Solve multi-step ratio and percent problems.
7.EE.A.2 Understand that rewriting an expression in different forms in a contextual problem can provide multiple ways of interpreting the problem and how the quantities in it are related. *For example, shoes are on sale at a 25% discount. How is the discounted price P related to the original cost C of the shoes? C - .25C = P. In other words, P is 75% of the original cost for C - .25C can be written as .75C.*	Generate an equivalent expression to highlight a given relationship within the problem, given a contextual problem and an expression that represents it. Choose multiple forms of an expression and explain how each accurately highlights a relationship between quantities in a problem. (AIT.8)
7.EE.B.3 Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers presented in any form (whole numbers, fractions, and decimals). **a.** Apply properties of operations as strategies to calculate with numbers in any form; convert between forms as appropriate.	Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers may or may not be required.

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Standards	Evidence of Learning Statements from Instructional Focus Document
b. Assess the reasonableness of answers using mental computation and estimation strategies.	
7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Add, subtract, factor, or expand linear expressions with rational coefficients.
7.EE.A.2 Understand that rewriting an expression in different forms in a contextual problem can provide multiple ways of interpreting the problem and how the quantities in it are related. *For example, shoes are on sale at a 25% discount. How is the discounted price P related to the original cost C of the shoes? C - .25C = P. In other words, P is 75% of the original cost for C - .25C can be written as .75C.*	Generate an equivalent expression to highlight a given relationship within the problem, given a contextual problem and an expression that represents it. Choose multiple forms of an expression and explain how each accurately highlights a relationship between quantities in a problem.

Quarter 3

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities. **a.** Solve contextual word problems leading to equations of the form *px + q = r* and *p(x + q) = r*, where *p, q*, and *r* are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*	Solve contextual problems leading to equations in the form px + q = r or p(x + q) = r.
7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities. **b.** Solve contextual word problems leading to inequalities of the form *px + q > r* or *px + q < r*, where *p, q*, and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example, as a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make and describe the solutions.* *(Note that inequalities using >, <, ≥ and ≤ are included in this standard)*	Solve contextual problems leading to inequalities in the form px + q > r or px + q < r. Graph the solution set for an inequality in the form px + q > r or px + q < r. Interpret the solution set for an inequality in the form px + q > r or px + q < r in the context of the problem.

Standards	Evidence of Learning Statements from **Instructional Focus Document**
7.G.B.4 Know and use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	Apply the properties of supplementary or complementary angles to write an equation to solve for unknown angles. Apply the relationship of vertical angles to write an equation to solve for unknown angles. Apply the properties of adjacent angles to write an equation to solve for unknown angles. Solve equations written using the relationships of angles to find the measurement of an unknown angle.
7.G.A.2 Draw geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle**.**	Construct geometric shapes with given conditions. Recognize when a set of segments cannot form a triangle. Recognize when conditions form a unique triangle, more than one triangle, or no triangle. Students should discover with visual representations or models that the sum of the angles in a triangle is 180°. (IFD IFS)
7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing, and reproducing a scale drawing at a different scale.	Solve problems involving scale drawings of geometric figures. Reproduce a scale drawing at a different scale.
7.G.B.3 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	Determine the radius and/or diameter of a circle given the circumference. Determine the radius and/or the diameter of a circle when given the area. Determine the area of a circle when given the circumference and vice versa. Solve a real-world problem that involves determining the area of a circle. Solve a real-world problem that involves determining the circumference of a circle.

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
	Express the area and circumference of a circle in terms of pi and as an approximate numerical value.

Informally explain the relationship between the circumference and area of a circle. |
| **7.G.B.5** Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. | Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. |

Quarter 4

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	Understand that an impossible event has a probability of 0 and that a certain event has a probability of 1. Understand that a probability closer to 0 represents an unlikely chance event, a probability close to 1/2 represents an equally likely (to occur or not occur) chance event and a probability closer to 1 represents a likely chance event. Understand that a chance event and its complement have a sum of 1. Conduct simple experiments and calculate probabilities as fractions, decimals, and/or percent. Determine where probabilities of simple events lie on the probability scale.
7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	Collect data on chance events by conducting experiments and approximate the relative frequency of an event given the probability. Differentiate between relative frequency and theoretical probability. Determine theoretical probability and relative frequency in real-world situations.
7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. **a.** Develop a uniform probability model by assigning equal probability to all outcomes and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*	Compare probability models to observed frequencies and explain any discrepancies between the model and observed frequencies. Recognize when discrepancies between theoretical probability and relative frequency indicate an error. Develop appropriate probability models to find probabilities of events with equally likely outcomes.
7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement	Develop appropriate probability models to find probabilities of events with outcomes that are not equally likely outcomes.

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
is not good, explain possible sources of the discrepancy. **b.** Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*	
7.SP.D.8 Summarize numerical data sets in relation to their context. **a.** Give quantitative measures of center (median and/or mean) and variability (range and/or interquartile 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 were gathered.	Determine the most appropriate measure of center and variability to summarize data derived from real world context. Use graphs to describe patterns in data derived from real world context. Recognize how measures of center and variability affect the shapes of data distributions.
7.SP.D.8 Summarize numerical data sets in relation to their context. **b.** Know and relate the choice of measures of center (median and/or mean) and variability (range and/or interquartile range) to the shape of the data distribution and the context in which the data was gathered.	Recognize how measures of center and variability affect the shapes of data distributions.
7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	Determine if a sample is representative of a population. Determine if a sample is biased. Identify factors that would contribute to bias. Generate random samples that are representative of a larger population. (AIT.3)
7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.	Recognize that increasing sample size affects sampling variability. Inferences and generalizations about a population using data from random samples.

Standards	Evidence of Learning Statements from [Instructional Focus Document](#)
For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	Justify inferences and generalizations using appropriate mathematical vocabulary. Recognize how sample variations affect the accuracy of predictions.
7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, on a dot plot, the separation between the two distributions of heights is noticeable.*	Compare the graphs of two data sets with similar variability to determine the degree of overlap. Recognize that an increase in variability can increase the overlap in data. Model and compare two real-world data sets by measuring the difference between their centers and expressing it as a multiple of a measure of variability.
7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*	Determine the appropriate measure of center or variability for comparing two data sets. Draw valid comparative inferences about two populations using measures of center. Valid comparative inferences about two populations using measures of variability. Identify valid inferences related to the comparison of two data sets.

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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.