Essential Standard - Standard should be taught in depth – These are the major work of the grade level

Supporting Standard- Support essential standards -Students need an intermediate understanding of these standards

Additional Standard- Students need a basic foundation of these standards

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Quarter 1

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
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8. Look for and express regularity in repeated reasoning

CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers. (PA Core- NWEA)

The Number System	**7.NS.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. 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. 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.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.

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		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.3	Solve real-world and mathematical problems involving the four operations with rational numbers.

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CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions. (PA Core-NWEA)		
Expressions and Equations	**7.EE.1**	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
	7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *Example: a+0.05a=1.05a means that "increase by 5%" is the same as "multiply by 1.05."*
CC.2.2.7.B.3 Model and solve real-life and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations. (PA Core – NWEA)		
Expressions and Equations	**7.EE.3**	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *Example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50.*
	7.EE.4	Use variables to represent quantities in a real-world or mathematical problem and construct simple questions and inequalities to solve problems by reasoning about the quantities.

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CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems. (PA Core – NWEA)

Ratios and Proportional Relationships	**7.RP.1**	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *Example:* *If a person walks ½ mile in each ¼ hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*
	7.RP.2	Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship *Example: 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.* b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. 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.
	7.RP.3	Use proportional relationships to solve multi-step ratio and percent problems.

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		Example: *Solve for simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*
CC.2.4.7.B.3 Investigate chance processes and develop, use and evaluate probability models. (PA Core – NWEA)		
Statistics and Probability	7.SP.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. *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.*
	7.SP.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. *Example: if a student is selected at random from a class, find the probability that Jane will be selected and the probability tha a girl will be selected.* b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *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?*
	7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

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		b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. *Example: Use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*
CC.2.3.7.A.2 Visualize and represent geometric figures and describe the relationships between them.		
Geometry	**7.G.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.
	7.G.2	Describe two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
	7.G.3	Draw (freehand, with ruler and protractor and with technology) 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.

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Quarter 4

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CC.2.4.7.B.1 Draw inferences about populations based on random sampling concepts. (PA Core – NWEA)		
Statistics and Probability	**7.SP.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.
	7.SP.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. *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.*
CC.2.4.7.B.2 Draw informal comparative inferences about two populations. (PA Core – NWEA)		
	7.SP.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.

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Statistics and Probability		*Example: The mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation/standard deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*
	7.SP.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *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.*
	7.SP.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 ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface are, circumference and volume. (PA Core- NWEA)		
Geometry	**7.G.4**	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.
	7.G.5	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.
	7.G.6	Solve real-world and mathematical problems involving area, volume, and surface area of 2- and 3-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. ***(can also be taught with first two standards – real world application)*** ***Surface area and volume can be used in equations as well)***