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| **Ratios and Proportional Relationships - 30 days*** Apply and extend previous understandings of equivalent ratios.
* Compute unit rates associated with ratios of fractions.
* Decide whether two quantities are in a proportional relationship by testing for equivalent ratios in a table.
* Recognize and represent proportional relationships between quantities
* Decide whether two quantities are in a proportional relationship by graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
* 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.
* Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams and verbal descriptions of proportional relationships.
* Represent proportional relationships by equations.
* Solve problems involving scale drawings of geometric figures.
* Use proportional relationships to solve multistep ratio and percent problems involving taxes and gratuities (tips).
* Use proportional relationships to solve multistep ratio and percent problem involving simple interest.
* Solve real-world and mathematical problems involving the four operations with rational numbers.
* Use proportional relationships to solve multistep ratio and percent problems involving percent increase, decrease, markups and markdowns.
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| **Rational Numbers – Topic 4 -10 days*** Apply and extend previous understandings of rational numbers, including opposites and absolute value as a distance from zero.
* 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.
* Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers.
* Use absolute value understanding to find 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.
* Interpret sums of rational numbers by describing real-world contexts.
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| **Quarterly 1** |
| **Rational Numbers – Topic 5 and 6 - 20 days*** Use horizontal or vertical number line diagrams to represent addition and subtraction.
* Solve subtraction problems involving rational numbers by adding the additive inverse, p - q = p + (-q).
* Find the distance between two rational numbers on the number line using the absolute value of their difference, and apply this principle in real-world contexts.
* 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.
* Apply properties of operations as strategies to multiply and divide rational numbers.
* Interpret products of rational numbers by describing real-world contexts.
* 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.
* Interpret quotients of rational numbers by describing real-world contexts.
* Apply properties of operations as strategies to multiply and divide rational numbers.
* Solve real-world and mathematical problems involving the four operations with rational numbers.
* 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.
* Convert a rational number to a decimal using long division.
* Recognize that the decimal form of a rational number terminates in 0s or eventually repeats.
* Apply and extend previous understandings of fractions, decimals, and percents to use them interchangeably to solve real-world and mathematical problems.
* Use proportional relationships to solve multistep ratio and percent problems involving percent error.
* Apply and extend previous understandings of fractions, decimals, and percents to use them interchangeably to solve problems.
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| **Expressions and Equations - 25 days*** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
* 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.
* Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations to solve problems by reasoning about the quantities.
* 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.
* Solve 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 this form fluently.
* Use variables to represent quantities in a real-world or mathematical problem, and construct simple inequalities to solve problems by reasoning about the quantities.
* Graph the solution set of the inequality and interpret it in the context of the problem.
* Solve 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.
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| **Quarterly 2** |
| **Geometry - 35 days*** Name parts of a geometric figure using appropriate letters and symbols.
* Measure parts of geometric figures using the appropriate tools and units of measure.
* Use facts about adjacent, complementary, supplementary and vertical angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
* Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions.
* Apply and extend previous understandings of circles.
* Solve problems using the formula for the circumference and area of a circle.
* Give an informal derivation of the relationship between the circumference and area of a circle.
* Construct triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
* Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
* Solve real-world and mathematical problems involving area of two-dimensional objects and surface area and volume of three-dimensional objects composed of triangles, quadrilaterals, and polygons.
* Solve real-world problems involving surface area and volume of a three-dimensional object composed of right prisms.
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| **Quarterly 3** |
| **Statistics - 20 days*** Understand that statistics can be used to gain information about a population by examining a sample of the population.
* Understand that generalizations about a population from a sample are valid only if the sample is representative of that population.
* 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.
* Use measures of center and measures of variability for numerical data from random samples.
* Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
* 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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| **Probability – 20 days*** Identify the probability of a chance event using a number between 0 and 1 to express the likelihood of the event occurring.
* 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.
* 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.
* Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
* Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams.
* 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.
* Identify the outcomes in a sample space that compose a compound event described in everyday language.
* 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.
* Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
* Design and use a simulation to generate frequencies for compound events.
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| **Quarterly 4** |