|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **7.NS.A**  Apply and extend previous understanding of operations with fractions to add, subtract, multiply, and divide rational numbers except division by zero.  **7.NS.A.1**  Add and subtract integers and other 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 (are additive inverses). Interpret sums of rational numbers by describing real-world context.  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 context.  d. Apply properties of operations as strategies to add and subtract rational numbers.  **7.NS.A.2**  Multiply and divide integers and other 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 context.  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 context.  c. Apply properties of operations as strategies to multiply and divide rational numbers.  d. Convert a rational number to decimal form using long division; know that the decimal form of a rational number terminates in 0’s or eventually repeats.  **7.NS.A.3**  Solve mathematical problems and problems in real-world context involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions where a/b ÷ c/d when a,b,c,and d are all integers and b,c, and d ≠ 0. | I can relate integers, their opposites, and their absolute values.  I can recognize rational numbers and write them in decimal form.  I can add integers.  I can subtract integers.  I can add and subtract rational numbers.  I can multiply integers.  I can multiply rational numbers.  I can divide integers.  I can divide rational numbers.  I can solve problems with rational numbers. | **Topic 1:** Integers and Rational Numbers | 1, 2, & 3 | \*Relate Integers and Their Opposites  \* Understand Rational Numbers  **\*** Add Integers  **\*** Subtract Integers  **\*** Add and Subtract Rational Numbers  **\*** Multiply Integers  **\*** Multiply Rational Numbers  **\*** Divide Integers  **\*** Divide Rational Numbers  **\*** Solve Problems with Rational Numbers | \*Topic Assessment  \*Quiz  \*Exit Ticket  \*Dot Check  \*Doc Cam Student Work | Absolute value  Associative Property  Commutative Property  Distributive Property  Integers  Rational number  terminating decimal  repeating decimal  additive inverse  complex fraction  multiplicative inverse |
| **7.RP.A**  Analyze proportional relationships and use them to solve mathematical problems and problems in real-world context.  **7.RP.A.1**  Compute unit rates associated with ratios involving both simple and complex fractions, including ratios of quantities measured in like or different units.  **7.RP.A.2**  Recognize and represent proportional relationships between quantities.  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).  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. 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.  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.A.3**  Use proportional relationships to solve multi-step ratio and percent problems (e.g., simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error). | I can use ratio concepts and reasoning to solve multi-step problems.  I can find unit rates with ratios of fractions and use them to solve problems.  I can test for equivalent ratios to decide whether quantities are in a proportional relationship.  I can use the constant of proportionality in an equation to represent a proportional relationship.  I can use a graph to determine whether two quantities are proportional.  I can determine whether a relationship is proportional and use representations to solve problems.  I can understand, find, and analyze percents of numbers.  I can use proportions to solve percent problems.  I can represent and solve percent problems using equations.  I can solve problems involving percent change and percent error.  I can solve problems involving percent mark up and mark down.  I can apply percent reasoning to solve simple interest problems. | **Topic 2:** Analyze and Use Proportional Relationships | 1, 2, & 3 | \* Connect Ratios, Rates, and Unit Rates  \* Determine Unit Rates with Ratios of Fractions  \* Understand Proportional Relationships: Equivalent Ratios  \* Describe Proportional Relationships: Constant of Proportionality  \* Graph Proportional Relationships  \* Apply Proportional Reasoning to Solve Problems | \*Topic Assessment  \*Quiz  \*Exit Ticket  \*Dot Check  \*Doc Cam Student Work | Constant of proportionality  Proportion  Proportional relationship |
| **7.EE.A**  Use properties of operations to generate equivalent expressions.  **7.EE.A.1**  Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.  **7.EE.A.2**  Rewrite an expression in different forms, and understand the relationship between the different forms and their meanings in a problem context. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."  **7.EE.B**  Solve mathematical problems and problems in real-world context using numerical and algebraic expressions and equations.  **7.EE.B.3**  Solve multi-step mathematical problems and problems in real-world context posed with positive and negative rational numbers in any form. Convert between forms as appropriate and assess the reasonableness of answers. For 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 per hour.  **7.EE.B.4**  Use variables to represent quantities in mathematical problems and problems in real-world context, and construct simple equations and inequalities to solve problems.  a. 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 these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.  b. Solve word problems leading to inequalities of the form px+q > r or px+q < r, where p, q, and r are rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. | I can write and evaluate algebraic expressions.  I can write equivalent expressions for given expressions.  I can use properties of operations to simplify expressions.  I can expand expressions using the Distributive Property.  I can use common factors and the Distributive Property to factor expressions.  I can add expressions that represent real-world problems.  I can subtract expressions using properties of operations.  I can use an equivalent expression to find new information. |  | 1, 2, & 3 |  |  | Percent equation  Percent change  Percent error  Markup  Markdown  Interest rate  Principal  Simple interest |