6th Grade Report Card Mathematics Skills: Students Will Know/ Students Will Be Able To...

Report Card Skill: Use ratio reasoning to solve problems

For this skill, students will know:

- a ratio compares two related quantities
- ratios can be represented in a variety of formats including *each, to per, for each, %, ⅕, etc.*
- a unit rate is the ratio of two measurements in which the second quantity is 1.
- when it is appropriate to use ratios/rates to solve mathematical or real life problems.
- mathematical strategies for solving problems involving ratios and rates, tables, tape diagrams, double line diagrams, equations, equivalent fractions, graphs, etc.
- a percent is a type of ratio that compares a quantity to 100.

For this skill, students will be able to:

- Use ratio language to describe a ratio relationship between two quantities.
- Represent a ratio relationship between two quantities using manipulatives and/or pictures, symbols and real-life situations. (a to b, a:b, or a/b)
- Represent unit rate associated with ratios using visuals, charts, symbols, real-life situations and rate language.
- Use ratio and rate reasoning to solve real-world and mathematical problems.
- Make and interpret tables of equivalent ratios.
- Plot pairs of values of the quantities being compared on the coordinate plane.
- Use multiple representations such as tape diagrams, double number line diagrams, or equations to solve rate and ratio problems.
- Solve unit rate problems (including unit pricing and constant speed).
- Solve percent problems, including finding a percent of a quantity as a rate per 100 and finding the whole, given the part and the percent.
- Describe the independent variable as the variable that you are given or the input.
- Describe the dependent variable as the variable that changes in relationship to the independent variable or the output.
- Identify the independent and dependent variable in measurement situations.

Report Card Skill: Solve problems involving division of fractions

For this skill, students will know:

- standard algorithms for addition, subtraction, multiplication and division of multi-digit decimals
- standard algorithms for dividing fractions

For this skill, students will be able to:

- compute quotients of fractions divided by fractions.
- explain the meaning of a quotient determined by division of fractions, using visual fraction models, equations, real-life situations, and language.
- divide multi-digit numbers fluently using the standard algorithm.
- fluently add, subtract, multiply and divide decimals to solve problems.

Report Card Skill: Order and compare rational numbers	
For this skill, students will know: ● positive and negative numbers are used together to describe quantities having opposite directions or values ● opposite signs of numbers as indicating locations on opposite sides of 0 on the number line ● signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane ● statements of inequality as the relative position of two numbers on a number line ● statements of order for rational numbers in real-world contexts ● absolute value of a rational number is its distance from 0 on the number line	**For this skill, students will be able to:** ● Identify an integer and its opposite and the directions they represent in real-world contexts. ● Use integers to represent quantities in real-world situations (above/ below sea level) ● Understand the meaning of 0 and where it fits into a situation. ● Represent and explain the value of a rational number as a point on a number line. ● Recognize that a number line can be both vertical and horizontal ● Represent a number and its opposite equidistant from zero on a number line. ● Identify that the opposite of the opposite of the number is itself. ● Incorporate opposites on the number line or plot opposite points on a coordinate grid where x and y intersect at zero. ● Represent signs of numbers in ordered pairs as locations in quadrants on the coordinate plane and explain the relationship between the location and the signs. ● Represent and explain reflections of ordered pairs on a coordinate plane. ● Locate and position integers and other rational numbers on horizontal or vertical number lines. ● Locate and position integers and other rational numbers on a coordinate plane. ● Identify the absolute value of a number as the distance from zero ● Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. ● Use inequalities to order integers relative to their position on the number line. ● Write statements of order for rational numbers in real-world contexts. ● Interpret statements of order for rational numbers in real-world contexts. ● Explain statements of order for rational numbers in real-world contexts.Represent the absolute value of a rational number as the distance from zero and recognize the symbol │ x │. ● Interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. ● Distinguish comparisons of absolute value from statements about order. (Compare rational numbers using absolute value in real-world situations. For negative numbers, as the absolute values increases, the value of the number decreases.) Solve real-world problems by graphing points in all four quadrants of the coordinate plane. ● Use coordinates to find distances between points with the same first coordinate or the same second coordinate. ● Use absolute value to find distances between points with the same first coordinate or the same second coordinate. ● Draw polygons in the coordinate plane given the coordinates for the vertices Use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. ● Solve real-world and mathematical problems involving polygons in the coordinate plane. ● Recognize that solving an equation or inequality is a process of

answering a question: which values from a specified set, if any, make the equation or inequality true?
- Determine whether a given number in a specified set makes an equation or inequality true with substitution.
- Write variable expressions when solving a mathematical problem or real-world problem, recognizing that a variable can represent an unknown number or any number in a specified set.
- Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
- Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a mathematical problem or a real-world problem.
- Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions.
- Represent solutions of inequalities on number line diagrams.

Report Card Skill: Analyze relationships between dependent and independent variables

For this skill, students will know:	**For this skill, students will be able to:**
- variables represent two quantities in a real-world problem that change in relationship to one another - the relationships between dependent and independent variables using graphs and tables, and relate these to equations	- Define independent and dependent variables. - Use variables to represent two quantities in a real-world problem that change in relationship to one another. - 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. - Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

Report Card Skill: Solve problems using expressions, equations and inequalities

For this skill, students will know:	**For this skill, students will be able to:**
- variables can represent an unknown number, or, depending on the purpose at hand, any number in a specified set - real-world and	- Write numerical expressions that have whole number exponents. - Evaluate numerical expressions that have whole number exponents and rational bases. - Write algebraic expressions to represent real life and mathematical situations. - Identify parts of an expression using appropriate terminology. - Given the value of a variable, students will evaluate the expression. - Use order of operations to evaluate expressions.

| mathematical problems can be answered by writing and solving equations | Apply properties of operations to write equivalent expressions. Identify when two expressions are equivalent. Prove (using various strategies) that two equations are equivalent no matter what number is substituted. Identify the factors of any whole number less than or equal to 100. Determine the Greatest Common Factor of two or more whole numbers less than or equal to 100. Identify the multiples of two whole numbers less than or equal to 12 and determine the Least Common Multiple. 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. |

Report Card Skill: Solve problems involving area, surface area, and volume	
For this skill, students will know: - the area of right triangles, other triangles, special quadrilaterals, and polygons by composing the polygon into rectangles or decomposing into triangles and other shapes - the formula for volume of a right rectangular prism. - procedures for finding surface area of pyramids and prisms.	**For this skill, students will be able to:** - Given irregular figures, students will be able to divide the shape into triangles and rectangles - Given a polygon, students will find the area using the decomposing shapes. - Given a polygon students will calculate the area by decomposing into composite figures (triangles and rectangles). - 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. - Calculate the volume of a right rectangular prism. - Apply the formula to solve real world mathematical problems involving volume with fractional edge lengths. - Represent 3D figures using nets of triangles and rectangles. - Solve real world problems involving surface areas using nets.

Report Card Skill: Engage in problem solving, reasoning, and communication (mathematical practice)	
For this skill, students will	**For this skill, students will be able to:**

know: ● how to make sense of problems and persevere in solving them ● how to construct viable arguments and critique the reasoning of others ● different representations can be used to model mathematics	● solve real-world problems through the application of algebraic and geometric concepts ● seek the meaning of a problem and look for different ways to represent and solve it ● construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models and graphs, tables, and other data displays ● refine their mathematical communication skills through discussions that evaluate their own thinking and the thinking of their peer ● Use clear and precise language/terminology in their discussions ● model problem situations symbolically, graphically, tabularly, and contextually ● explain the connections between different representations ● consider available tools when solving a mathematical problem and decide when certain tools may be helpful

Report Card Skill: Perform operations with whole numbers (foundations)	
For this skill, students will know: ● and apply the rules for performing operations with whole numbers	**For this skill, students will be able to:** ● perform operations with whole numbers