6th Grade Math: I Can Statements

Processes, Content Statements & Expectations (Disciplinary Knowledge)	**I Can Statement**
<u>Ratios and Proportional Relationships</u>	
Understand ratio concepts and use ratio reasoning to solve problems.	
6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	I can write a ratio that describes a relationship between two quantities. I can explain what a ratio represents. I can simplify a ratio.
6.RP.2 Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*1	I can explain what a given rate means. I can create a rate from a story problem. I can find unit rates.

6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	I can solve real world problems involving rates and ratios. I can find equivalent ratios. I can create a table of equivalent ratios. I can find missing values in a table of equivalent ratios, I can plot ratios on a coordinate plane. I can compare ratios. I can use unit rates to solve real world problems. I can write a percent as a rate per 100. I can solve problems involving finding the whole, given a part and the percent. I can use ratios to convert measurement units.
<u>Number System</u>	
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	

6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*	I can create a real world story for division of fractions. I can use models to divide fractions by fractions. I can divide fractions by fractions. I can solve real world problems involving dividing fractions. I can write a related multiplication problem for a division problem involving fractions.
Compute fluently with multi-digit numbers and find common factors and multiples.	
6.NS.2 Fluently divide multi-digit numbers using the standard algorithm.	I can easily divide multi-digit numbers.
6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	I can easily add multi-digit numbers I can easily subtract multi-digit numbers. I can easily multiply multi-digit numbers.
6.NS.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. 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. *For example, express 36 + 8 as 4 (9 + 2).*	I can find the greatest common factor of two whole numbers. I can find the prime factorization of a number. I can find the least common multiple of tow whole numbers less than or equal to 12. I can use the distributive property rewrite addition problems with a common factor.
Apply and extend previous understandings of numbers to the system of rational numbers.	

6.NS.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	I can give real world examples of negative numbers. I can put real world negative and positive numbers on a number line. I can explain the meaning of 0 in real world problems.
6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	I can prove that a number is rational. I can put rational numbers on a number line. I can find the opposite of a number. I can find the opposite of an opposite (It's the number itself). I can plot ordered pairs on a coordinate plane. I can state when two points are a reflection. I can put integers on a number line. I can put rational numbers on a number line.

6.NS.7 Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.* b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3˚C > –7˚C to express the fact that –3˚C is warmer than –7˚C.* c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.* d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.*	I can find the absolute value of a rational number. I can tell that a number is to the right or left of another number on a number line when given an inequality. I can compare real world rational numbers. I can explain what an inequality means in the real world. I can find the absolute value of a rational number. I can use absolute values to describe real world rational numbers. I can use absolute values to describe comparisons of real world rational numbers.
6.NS.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	I can solve real world problems using coordinate planes. I can find the distance between points with a common coordinate on a coordinate plane.
Expressions and Equations	
Apply and extend previous understandings of arithmetic to algebraic expressions.	
6.EE.1 Write and evaluate numerical expressions involving whole-number exponents.	I can solve problems with exponents.

6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.* b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.* c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2.*	I can write a variable expression given a word problem. I can identify the parts of an expression. I can chunk parts in a multistep problem. I can use order of operations to solve problems. I can use formulas to solve problems. I can solve variable expressions given a specific value for the variable.
6.EE.3 Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	I can use the distributive property to write equivalent expressions. I can combine like terms in a variable expression.
6.EE.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	I can state if two expressions are equivalent.

Reason about and solve one-variable equations and inequalities.	
6.EE.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	I can state whether a given value will make an equation or inequality true.
6.EE.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	I can use variables to represent numbers in problems. I can write variable expressions from real world problems. I can explain what the variable represents.
6.EE.7 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.	I can solve one step variable equations.
6.EE.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	I can write an inequality to represent a real world situation. I can graph inequalities on a number line. I can recognize that inequalities have infinitely many solutions.
Represent and analyze quantitative relationships between dependent and independent variables.	
6.EE.9 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. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.*	I can write two variable equations to represent real world problems. I can identify the dependent and independent variables. I can make charts and graphs of two variable equations. I can state the relationship between the two variables.
Geometry	

Solve real-world and mathematical problems involving area, surface area, and volume.	
6.G.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	I can find the area of triangles. I can find the area of special quadrilaterals. I can find the area of figures by breaking them down into triangles and special quadrilaterals.
6.G.2 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. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	I can find the volume of a right rectangular prism with fractional edge lengths by using unit cubes. I can use the formula $V= l\ w\ h$. I can use the formula $V = b\ h$. I can use the volume formula to solve real world problems.
6.G.3 Draw polygons in the coordinate plane given 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. Apply these techniques in the context of solving real-world and mathematical problems.	I can draw a polygon in a coordinate plane give the coordinates. I can find the length of a side of a polygon in a coordinate plane with a shared coordinate.
6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	I can create a net for a three-dimensional figure that has faces made up of rectangles and triangles. I can use nets to find the surface area of three-dimensional figures. I can solve real world problems involving surface area and nets.
Statistics and Probability	
Develop understanding of statistical variability.	

6.SP.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	I can explain what a statistical question is. I can identify statistical questions.
6.SP.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	I can find the center of a set of data. I can find the spread of a set of data. I can describe the overall shape of a set of data.
6.SP.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	I can explain what a center of a numerical data set summarizes. I can explain what a measure of variation describes.
Summarize and describe distributions.	
6.SP.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	I can create a dot plot. I can create a histogram. I can create a box plot.

6.SP.5 Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), 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. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	I can state how much data was recorded. I can state how an attribute was measured. I can state the units of measurements of an attribute. I can find the median. I can find the mean. I can find the interquartile range. I can find the mean absolute deviation. I can describe the overall pattern and any striking deviations from the overall pattern. I can explain how all the different statistics relate to the data itself. I can explain how the measure of center relates to the data distribution and the context in which the data was gathered.