

Grade 6 Grade-Level Expanded Expectations

RATIOS AND PROPORTIONAL RELATIONSHIPS: RP

6.RP.A	Understand and use ratios to solve problems.	
6.RP.A.1	Understand a ratio as a comparison of two quantities and represent these comparisons.	The expectation for the student is to understand a ratio as a comparison of two quantities and represent these comparisons in the form of ratios and as verbal statements.
6.RP.A.2	Understand the concept of a unit rate associated with a ratio, and describe the meaning of unit rate.	The expectation for the student is to understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and describe the meaning of unit rate in the context of the relationship. (e.g., If a 4 pound bag of apples costs \$3, what is the unit rate in price per pound)
6.RP.A.3	<p>Solve problems involving ratios and rates.</p> <ul style="list-style-type: none"> a) Create tables of equivalent ratios, find missing values in the tables and plot the pairs of values on the Cartesian coordinate plane. b) Solve unit rate problems. c) Solve percent problems. d) Convert measurement units within and between two systems of measurement. 	<p>The expectation for the student is to solve real-world mathematical problems involving ratios and rates utilizing strategies such as tables of equivalent ratios, tape diagrams, bar models, double number line diagrams and/or equations.</p> <ul style="list-style-type: none"> a. Make tables of equivalent ratios, find missing values in the tables and plot the pairs of values on the Cartesian coordinate plane. Use tables to compare ratios. b. Solve unit rate problems. (e.g., <i>pricing and constant speed</i>) c. Calculate a percent of a quantity as a rate per 100; given a percent, solve problems involving finding the whole given a part and the part given the whole. d. Convert measurement units within and between two systems of measurements while solving problems. Given a conversion factor such as $1'' = 2.54 \text{ cm}$, use ratios to compare sizes of similar figures with different units.

NUMBER SENSE AND OPERATIONS: NS

6.NS.A	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	
6.NS.A.1	<p>Compute and interpret quotients of positive fractions.</p> <p>a) Solve problems involving division of fractions by fractions.</p>	<p>The expectation for the student is to compute and represent quotients of positive fractions.</p> <p>a. Compute quotients of fractions divided by fractions.</p> <p>b. Solve word problems involving division of fractions by fractions, including reasoning strategies such as using visual fraction models, area models and/or equations to represent the problem.</p>
6.NS.B	Compute with non-negative multi-digit numbers, and find common factors and multiples.	
6.NS.B.2	Demonstrate fluency with division of multi-digit whole numbers.	The expectation for the student is to demonstrate fluency with division of multi-digit whole numbers. (<i>Fluency refers to accuracy and efficiency and does not equate to memorization.</i>)
6.NS.B.3	Demonstrate fluency with addition, subtraction, multiplication and division of decimals.	The expectation for the student is to demonstrate fluency with addition, subtraction, multiplication and division of decimals. (<i>Fluency refers to accuracy and efficiency and does not equate to memorization.</i>)
6.NS.B.4	<p>Find common factors and multiples.</p> <p>a) Find the greatest common factor (GCF) and the least common multiple (LCM).</p> <p>b) Use the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers.</p>	<p>The expectation for the student is to find common factors and multiples.</p> <p>a. Find common factors and multiples, including the greatest common factor (GCF) of two whole numbers that are each ≤ 100 and the least common multiple (LCM) of two whole numbers that are each ≤ 12.</p> <p>b. 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. (<i>e.g., $48+24$ could be as $24(2+1)$ or $6(8+4)$</i>)</p>
6.NS.C	Apply and extend previous understandings of numbers to the system of rational numbers.	
6.NS.C.5	Use positive and negative numbers to represent quantities.	The expectation for the student is to use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. Understand that positive and negative numbers are used together to describe quantities that have opposite values.
6.NS.C.6	<p>Locate a rational number as a point on the number line.</p> <p>a) Locate rational numbers on a horizontal or vertical number line.</p>	<p>The expectation for the student is to understand a rational number as a point on the number line.</p> <p>a. Locate rational numbers on a horizontal or vertical number line.</p> <p>b. Write, interpret and explain statements of order for rational</p>

	<ul style="list-style-type: none"> b) Write, interpret and explain problems of ordering of rational numbers. c) Understand that a number and its opposite (additive inverse) are located on opposite sides of zero on the number line. 	<ul style="list-style-type: none"> numbers in mathematical and real-world contexts. c. Understand that a number and its opposite (additive inverse) are located on opposite sides of zero on the number line. Their sum will always be zero.
6.NS.C.7	Understand that the absolute value of a rational number is its distance from 0 on the number line.	The expectation for the student is to understand that the absolute value of a rational number is its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
6.NS.C.8	Extend prior knowledge to generate equivalent representations of rational numbers between fractions, decimals and percentages (limited to terminating decimals and/or benchmark fractions of $\frac{1}{3}$ and $\frac{2}{3}$).	The expectation for the student is to extend prior knowledge to generate equivalent representations of rational numbers between fractions, decimals and percentages (limited to terminating decimals and/or benchmark fractions of $\frac{1}{3}$ and $\frac{2}{3}$).

EXPRESSIONS, EQUATIONS AND INEQUALITIES: EEI

6.EEI.A	Apply and extend previous understandings of arithmetic to algebraic expressions.	
6.EEI.A.1	Describe the difference between an expression and an equation.	The expectation for the student is to describe the difference between an expression and an equation.
6.EEI.A.2	<p>Create and evaluate expressions involving variables and whole number exponents.</p> <ul style="list-style-type: none"> a) Identify parts of an expression using mathematical terminology. b) Evaluate expressions at specific values of the variables. c) Evaluate non-negative rational number expressions. d) Write and evaluate algebraic expressions. e) Understand the meaning of the variable in the context of the situation. 	<p>The expectation for the student is to read, write and evaluate expressions involving whole number exponents in which letters are used to represent quantities that are either unknown or that vary.</p> <ul style="list-style-type: none"> a. Identify parts of an expression using mathematical terminology. (e.g., sum, term, product, factor, quotient, coefficient and constant) b. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. c. Evaluate expressions involving addition, subtraction, multiplication and division of non-negative rational numbers, grouping symbols and whole-number exponents using the order of operations. d. Write expressions using variables (letters) to represent quantities in real-world and mathematical problems. e. Understand the meaning of the variable in the context of the

		situation. (e.g., express the calculation “Subtract y from 5” as $5 - y$)
6.EE1.A.3	Identify and generate equivalent algebraic expressions using mathematical properties.	The expectation for the student is to identify and generate equivalent algebraic expressions using mathematical properties. (e.g., commutative, associative, distributive)
6.EE1.B	Reason about and solve one-variable equations and inequalities.	
6.EE1.B.4	Use substitution to determine whether a given number in a specified set makes a one-variable equation or inequality true.	The expectation for the student is to use substitution to determine whether a given number in a specified set makes a one-variable equation or inequality true.
6.EE1.B.5	Understand that if any solutions exist, the solution set for an equation or inequality consists of values that make the equation or inequality true.	The expectation for the student is to understand that if any solutions exist, the solution set for an equation or inequality consists of values that make the equation or inequality true.
6.EE1.B.6	Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation.	The expectation for the student is to write equations using variables (letters) to represent quantities in real-world and mathematical situations. Understand the meaning of the variable in the context of the situation.
6.EE1.B.7	Solve one-step linear equations in one variable involving non-negative rational numbers.	The expectation for the student is to solve one-step linear equations in one variable involving non-negative rational numbers for real-world and mathematical problems.
6.EE1.B.8	Recognize that inequalities may have infinitely many solutions. a) Write an inequality of the form $x > c$, $x < c$, $x \geq c$ or $x \leq c$ to represent a constraint or condition. b) Graph the solution set of an inequality.	The expectation for the student is to recognize that inequalities may have infinitely many solutions. a. Write an inequality of the form $x > c$, $x < c$, $x \geq c$ or $x \leq c$ to represent a constraint or condition in a real-world or mathematical problem, where c is a constant. b. Graph solutions of such inequalities on a number line.
6.EE1.C	Represent and analyze quantitative relationships between dependent and independent variables.	
6.EE1.C.9	Identify and describe relationships between two variables that change in relationship to one another. a) Write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable.	The expectation for the student is to identify and describe relationships between two variables that change in relationship to one another. (e.g., <i>plant growth related to time</i>) a. Write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. b. Analyze the relationship between the dependent and independent

	b) Analyze the relationship between the dependent and independent variables using graphs, tables and equations and relate these representations to each other.	variables using graphs, tables and equations and relate these representations to each other.
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GEOMETRY AND MEASUREMENT: GM

6.GM.A	Solve problems involving area, surface area and volume.	
6.GM.A.1	Find the area of polygons by composing or decomposing the shapes into rectangles or triangles.	The expectation for the student is to find the area of polygons by composing or decomposing the shapes into rectangles or triangles and apply these techniques to solve real-world problems.
6.GM.A.2	<p>Find the volume of right rectangular prisms.</p> <p>a) Understand that the volume of a right rectangular prism can be found by filling the prism with multiple layers of the base.</p> <p>b) Apply $V = l * w * h$ and $V = Bh$ to find the volume of right rectangular prisms.</p>	<p>The expectation for the student is to find the volume of right rectangular prisms.</p> <p>a. Understand that the volume of a right rectangular prism can be found by filling the prism with multiple layers of the base. Discover that using visual models (<i>e.g., model by packing</i>) produces the same volume as using the formulas, whether the side lengths are whole or fractional edge lengths.</p> <p>b. Apply $V = l * w * h$ and $V = Bh$ to find the volume of right rectangular prisms with whole or fractional edges for real-world and mathematical problems.</p>
6.GM.A.3	<p>Solve problems by graphing points in all four quadrants of the Cartesian coordinate plane.</p> <p>a) Understand signs of numbers in ordered pairs as indicating locations in quadrants of the Cartesian coordinate plane</p> <p>b) Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.</p> <p>c) Find distances between points with the same first coordinate or the same second coordinate.</p> <p>d) Construct polygons in the Cartesian</p>	<p>The expectation for the student is to solve real-world and mathematical problems by graphing points in all four quadrants of the Cartesian coordinate plane.</p> <p>a. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the Cartesian coordinate plane.</p> <p>b. Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.</p> <p>c. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate (length of horizontal or vertical line segments).</p> <p>d. Draw polygons in the Cartesian coordinate plane given coordinates for the vertices.</p>

	coordinate plane.	
6.GM.A.4	<p>Solve problems using nets.</p> <p>a) Represent three-dimensional figures using nets made up of rectangles and triangles.</p> <p>b) Use nets to find the surface area of three-dimensional figures whose sides are made up of rectangles and triangles.</p>	<p>The expectation for the student is to solve real-world and mathematical problems using nets.</p> <p>a. Represent three-dimensional figures using nets made up of rectangles and triangles.</p> <p>b. Use nets to find the surface area of three-dimensional figures whose sides are made up of rectangles and triangles and to solve real-world and mathematical problems.</p>

DATA ANALYSIS, STATISTICS AND PROBABILITY: DSP

6.DSP.A	Develop understanding of statistical variability.	
6.DSP.A.1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	The expectation for the student is to recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
6.DSP.A.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.	The expectation for the student is to 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 of its representation.
6.DSP.A.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 from a single number.	The expectation for the student is to 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 from a single number.
6.DSP.B	Summarize and describe distributions.	
6.DSP.B.4	<p>Display and interpret data.</p> <p>a) Use dot plots, histograms and box plots to display and interpret numerical data.</p> <p>b) Create and interpret circle graphs.</p>	<p>The expectation for the student is to display and interpret data.</p> <p>a. Use dot plots, histograms and box plots to display and interpret numerical data.</p> <p>b. Create circle graphs and interpret the data in context of real-world and mathematical situations using sample sizes which yield whole number angle measurements. (<i>e.g., sample sizes of 90, 180 or 360</i>)</p>
6.DSP.B.5	<p>Summarize numerical data sets in relation to the context.</p> <p>a) Report the number of observations.</p>	<p>The expectation for the student is to summarize numerical data sets in relation to their context by the following:</p> <p>a. Reporting the number of observations.</p>

	<ul style="list-style-type: none">b) Describe the nature of the attribute under investigation, including how it was measured and its units of measurement.c) Give 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 of the data.d) Analyze the choice of measures of center and variability based on the shape of the data distribution and/or the context of the data.	<ul style="list-style-type: none">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 of the data.d. Analyze the choice of measures of center and variability to the shape of the data distribution and the context of the data.
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