

Grade 6

Concepts and Procedures

Ratios and Proportional Relationships

<p>RANGE PLD Target A: Understand ratio concepts and use ratio reasoning to solve problems.</p>	<p>Level 1 students should be able to describe a ratio relationship between two whole-number quantities and plot the pairs of values from a table on the coordinate plane. They should be able to find a percent as a rate per hundred and convert measurement units.</p>	<p>Level 2 students should be able to determine the unit rate when solving one-step problems requiring ratio reasoning. Students should be able to find missing values in tables that display a proportional relationship in consecutive increments.</p>	<p>Level 3 students should be able to use ratio reasoning to find unit rates in multistep problems, including instances of unit pricing and constant speed. They should be able to solve percent problems by finding the whole given a part and the percent. Students should be able to find missing values in tables that display a proportional relationship in nonconsecutive increments.</p>	<p>Level 4 students should be able to solve real-world and mathematical multistep problems involving percents. Students should be able to explain and apply ratio relationships between models or representations.</p>
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The Number System

<p>RANGE PLD Target B: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</p>	<p>Level 1 students should be able to apply and extend previous understandings of multiplication and division to multiply a fraction by a fraction, divide a fraction by a whole number between 0 and 1, and connect to a visual model. They should be able to understand the effect that a fraction greater than or less than 1 has on a whole number when multiplied and use or create visual models when multiplying a whole number by a fraction between 0 and 1.</p>	<p>Level 2 students should be able to apply and extend previous understandings of multiplication and division to divide a whole number by a fraction, divide a mixed number by a whole number, and connect to a visual model.</p>	<p>Level 3 students should be able to apply and extend previous understandings of multiplication and division to divide a fraction or mixed number by another fraction or mixed number and connect to a visual model.</p>	<p>Level 4 students should be able to apply and extend previous understandings of multiplication and division to solve real-world and mathematical problems. Students should be able to interpret the meaning of the quotient as related to the context of the problem.</p>
<p>RANGE PLD Target C: Compute fluently with multidigit numbers and find common factors and multiples.</p>	<p>Level 1 students should be able to add, subtract, and multiply multidigit whole numbers and decimals to hundredths. They should be able to use the distributive property to express the sum of two whole</p>	<p>Level 2 students should be able to divide multidigit whole numbers, express remainders as whole numbers, and add, subtract, and multiply multidigit decimal numbers. They should be able to find common</p>	<p>Level 3 students should be able to fluently divide multidigit numbers and add, subtract, multiply, and divide multidigit decimal numbers. Students should express remainders as a decimal or a simplified fraction.</p>	<p>Level 4 students should be able to apply multidigit computation and the distributive property to solve real-world and mathematical problems and interpret the meaning of the answer.</p>

	numbers with a common factor.	factors of two numbers less than or equal to 100 and multiples of two numbers less than or equal to 12.	They should be able to find the greatest common factor of two numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.	
RANGE PLD Target D: Apply and extend previous understandings of numbers to the system of rational numbers.	Level 1 students should be able to place all integers on a number line and integer pairs on a coordinate plane with one-unit increments on both axes.	Level 2 students should be able to apply and extend previous understanding of whole numbers to order rational numbers and interpret statements of their order in the context of a situation. They should be able to place all rational numbers on a number line and integer pairs on a coordinate plane with various axis increments. They should be able to relate changes in sign to placements on opposite sides of the number line and understand the absolute value of a number as its distance from zero on a number line.	Level 3 students should be able to apply and extend previous understanding of numbers to relate statements of inequality to relative positions on a number line, place points with rational coordinates on a coordinate plane, and solve problems involving the distance between points when they share a coordinate. They should be able to demonstrate understanding of absolute value and ordering by using number lines and models and relating reflection across axes to changes in sign.	Level 4 students should be able to interpret statements of inequality to include all possible solutions.

Expressions and Equations

<p>RANGE PLD Target E: Apply and extend previous understandings of arithmetic to algebraic expressions.</p>	<p>Level 1 students should be able to evaluate numerical expressions without exponents, write one- or two-step numerical expressions, and identify parts of an expression using terms (e.g., coefficient, term, sum, product, difference, quotient, and factor).</p>	<p>Level 2 students should be able to evaluate numerical expressions with whole number exponents that do not need to be distributed across a set of parentheses. They should be able to apply and extend previous understandings of arithmetic to evaluate expressions with variables that do not contain exponents. They should be able to write one- and two-step algebraic expressions that introduce a variable and identify equivalent expressions.</p>	<p>Level 3 students should be able to write and evaluate numerical expressions with whole number exponents and expressions from formulas in real-world problems and apply and extend previous understandings of arithmetic to evaluate expressions with variables that include the distributive property and whole number exponents. They should be able to apply properties of operations to generate equivalent expressions.</p>	<p>Level 4 students should be able to apply the understanding of the properties of operations and use the properties to show why two expressions are equivalent.</p>
<p>RANGE PLD Target F: Reason about and solve one-variable equations and inequalities.</p>	<p>Level 1 students should be able to use substitution to determine when a given number makes equations or inequalities true.</p>	<p>Level 2 students should be able to solve one-variable equations and inequalities of the form $x + p = \frac{q}{r}$ or $px = \frac{q}{r}$, where p and q are nonnegative rational numbers. They should be able to identify and use variables when solving equations.</p>	<p>Level 3 students should be able to write one-variable equations and inequalities of the form $x + p = \frac{q}{r}$ or $px = \frac{q}{r}$, where p and q are nonnegative rational numbers. They should be able to solve equations and inequalities and graph their solutions on a number line.</p>	<p>Level 4 students should be able to write and solve equations and inequalities of the form $x + p = \frac{q}{r}$ or $px = \frac{q}{r}$, where p and q are rational numbers. They should be able to identify specific rational number solutions in that set.</p>
<p>RANGE PLD Target G: Represent and analyze quantitative relationships between dependent and independent variables.</p>	<p>Level 1 students should be able to identify tables that represent a relationship between two variables of the forms $y = kx$ and $y = x \pm c$ with rational numbers and plot points corresponding to equations on coordinate planes.</p>	<p>Level 2 students should be able to use variables to represent and analyze two quantities that change in relationship to each other of the form $y = kx$ or $y = x \pm c$ with rational numbers and use graphs and tables to represent the relationship.</p>	<p>Level 3 students should be able to use graphs, tables, or context to analyze the relationship between dependent and independent variables and relate them to a linear equation.</p>	<p>Level 4 students should be able to use graphs, tables, or context to analyze two-step equations that represent relationships between dependent and independent variables</p>

Geometry

<p>RANGE PLD Target H: Solve real-world and mathematical problems involving area, surface area, and volume.</p>	<p>Level 1 students should be able to find areas of right triangles; draw polygons with positive coordinates on a grid with a scale in one-unit increments, given nonnegative, integer-valued coordinates for the vertices; and find the volume of right rectangular prisms with one side expressed as a fraction or a mixed number in halves or fourths.</p>	<p>Level 2 students should be able to find areas of special quadrilaterals and triangles; draw polygons in the four-quadrant coordinate plane with scales in one-unit increments, given integer-valued coordinates for the vertices; and find the volume of right rectangular prisms with one side expressed as a fraction or a mixed number.</p>	<p>Level 3 students should be able to solve real-world and mathematical problems that involve finding areas of polygons and special quadrilaterals and triangles, including by composing and decomposing with rectangles and triangles. Students should be able to find surface area using nets made up of rectangles and triangles. Students should be able to find the volume of right rectangular prisms with all sides expressed as a positive rational number. They should be able to solve problems by drawing polygons in the four-quadrant coordinate and determine the length of a side joining the coordinates of vertices with the same first or the same second coordinate.</p>	<p>Level 4 students should be able to solve real-world and mathematical problems involving surface area and volume of a compound figure composed of right rectangular prisms to solve problems.</p>
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Statistics and Probability

<p>RANGE PLD Target I: Develop understanding of statistical variability.</p>	<p>Level 1 students should be able to identify questions that lead to variable responses and recognize that such questions are statistical questions.</p>	<p>Level 2 students should be able to recognize that questions that lead to variable responses are statistical questions, and vice versa, and relate the concept of varying responses to the notion of a range of possible responses. They should demonstrate an understanding that the responses to a statistical question will have a representative center and a given set of numerical data. They should be able to identify a reasonable measure of central tendency with respect to a familiar context.</p>	<p>Level 3 students should be able to pose statistical questions and demonstrate understanding that the responses to a statistical question have a distribution described by its center, spread, and overall shape. They should be able to demonstrate understanding that a measure of center summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. They should be able to identify a reasonable center and spread with respect to a familiar context.</p>	<p>Level 4 students should be able to justify the reasonableness of their identified center and spread with respect to a contextual situation. They should be able to create or complete a data set with given measures (e.g., mean, median, interquartile range).</p>
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<p>RANGE PLD Target J: Summarize and describe distributions.</p>	<p>Level 1 students should be able to summarize or display numerical data on a number line, in dot plots, and in histograms; find the median of data points; and find the mean when data points are nonnegative integers.</p>	<p>Level 2 students should be able to summarize and display data in a box plot. They should be able to calculate measures of center, demonstrate understanding that measures of center can be different or the same, and use the measure of center to summarize data with respect to the context.</p>	<p>Level 3 students should be able to find the interquartile range and/or mean absolute deviation of a data set. They should be able to use variability and measures of center to describe overall patterns in a data distribution, such as symmetry, clusters, and any striking deviations. They also should be able to examine a data set in context and choose appropriate measures of center, as it relates to the data.</p>	<p>Level 4 students should be able to relate the choice of measures of center and variability to the shape of the data distribution in context of the data, identify outliers with reference to the context of the situation, and predict effects on the measures of center given a change in data points.</p>
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