



BLUE VALLEY DISTRICT CURRICULUM
MATHEMATICS |
Advanced Integrated
Algebra 6



ORGANIZING THEME/TOPIC

FOCUS STANDARDS & SKILLS

<p>Compute fluently with multi-digit numbers and find common factors and multiples.</p> <p>Apply and extend previous understandings of arithmetic to algebraic expressions.</p>	<p>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.</p> <p>6.EE.1 Write and evaluate numerical expressions involving whole-number exponents.</p> <p>6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers.</p> <p>6.EE.2b 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.</p> <p>6.EE.2c 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).</p> <p>6.EE.3 Apply the properties of operations to generate equivalent expressions.</p>
<p>Understand ratio concepts and use ratio reasoning to solve problems.</p>	<p>6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</p>

Compute fluently with multi-digit numbers and find common factors and multiples.

Apply and extend previous understandings of numbers to the system of rational numbers.

- 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.
- 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.
 - 6.RP.3a 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.
 - 6.RP.3b Solve unit rate problems including those involving unit pricing and constant speed.
 - 6.RP.3c 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.
- 6.NS.2 Fluently divide multi-digit numbers using the standard algorithm.
- 6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals
- 6.NS.4 Find the greatest common factor of two whole number 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 the 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.
- 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.

	<p>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.</p> <p>6.NS.6a 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.</p> <p>6.NS.6c 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.</p> <p>6.NS.7 Understand ordering and absolute value of rational numbers.</p> <p>6.NS.7a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.</p> <p>6.NS.7b Write, interpret, and explain statements of order for rational numbers in real-world context.</p> <p>6.NS.7c 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.</p> <p>6.NS.7d Distinguish comparisons of absolute value from statements about order.</p>
<p>Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</p> <p>Compute fluently with multi-digit numbers and find common factors and multiples</p>	<p>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</p> <p>6.NS.2 Fluently divide multi-digit numbers using the standard algorithm</p>

Apply and extend previous understandings of numbers to the system of rational numbers.

Apply and extend previous understandings of arithmetic to algebraic expressions.

Reason about and solve one-variable equations and inequalities.

- 6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation
- 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.
- 6.NS.6 Understand a rational number as a point on the number line. Extend number line diagram and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
- 6.EE.1 Write and evaluate numerical expression involving whole-number exponents.
- 6.EE.2c 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).
- 6.EE.3 Apply the properties of operations to generate equivalent expressions.
- 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). Investigation 1
- 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.
- 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.

	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.
<p>Apply and extend previous understandings of numbers to the system of rational numbers.</p> <p>Apply and extend previous understandings of arithmetic to algebraic expressions.</p> <p>Reason about and solve one-variable equations and inequalities.</p> <p>Represent and analyze quantitative relationships between dependent and independent variables.</p>	<p>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.</p> <p>6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers.</p> <p>6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers.</p> <p>6.EE.2c 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).</p> <p>6.EE.3 Apply the properties of operations to generate equivalent expressions.</p> <p>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).</p> <p>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.</p> <p>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.</p>

<p>Solve real-world and mathematical problems involving area, surface area, and volume.</p>	<p>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.</p> <p>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 $V=lwh$ and $V=bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</p> <p>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.</p> <p>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.</p>
<p>Understand ratio concepts and use ratio reasoning to solve problems</p>	<p>6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</p> <p>6.RP2 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.</p> <p>6.RP.3c 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.</p>

<p>Compute fluently with multi-digit numbers and find common factors and multiples.</p> <p>Apply and extend previous understandings of arithmetic to algebraic expressions.</p> <p>Solve real-world and mathematical problems involving area, surface area, and volume.</p>	<p>6.NS.2 Fluently divide multi-digit numbers using the standard algorithm</p> <p>6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p> <p>6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers.</p> <p>6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers.</p> <p>6.EE.3 Apply the properties of operations to generate equivalent expressions.</p> <p>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.</p>
<p>Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</p>	<p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical line diagram.</p> <p>7.NS.1a Describe situations in which opposite quantities combine to make zero.</p> <p>7.NS.1b 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 contexts.</p> <p>7.NS.1c 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 contexts.</p>

	<p>7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2a 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 contexts.</p> <p>7.NS.2b Understand that integers can be divided, provided that the divisor is not 0, 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 contexts.</p> <p>7.NS.2c Apply properties of operations as strategies</p>
<p>Understand ratio concepts and use ratio reasoning to solve problems.</p> <p>Apply and extend previous understandings of numbers to the system of rational numbers.</p>	<p>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.</p> <p>6.RP.3a 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.</p> <p>6.RP.3b Solve unit rate problems including those involving unit pricing and constant speed.</p> <p>6.RP.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities</p> <p>6.NS.6b 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 location of the points are related by reflections across one or both axes.</p>

Apply and extend previous understandings of arithmetic to algebraic expressions.

Reason about and solve one-variable equations and inequalities.

- 6.NS.6c 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.
- 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.
- 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers.
 - 6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers.
 - 6.EE.2c 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).
- 6.EE.3 Apply the properties of operations to generate equivalent expressions.
- 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).
- 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.
- 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.

<p>Represent and analyze quantitative relationships between dependent and independent variables.</p>	<p>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.</p> <p>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.</p> <p>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.</p>
<p>Compute fluently with multi-digit numbers and find common factors and multiples.</p> <p>Apply and extend previous understandings of arithmetic to algebraic expressions.</p> <p>Develop understanding of statistical variability.</p> <p>Summarize and describe distributions.</p> <p>Summarize numerical data sets in relation to their context by....</p>	<p>6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p> <p>6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>6.SP.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p>6.SP.5a ..reporting the number of observations.</p>

6.SP.5b...describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

6.SP.5c ...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.

6.SP.5d ...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.