Kansas Mathematics

Grade 6

Adopted 2017

Standards for Mathematical Practice

1. **Make sense of problems and persevere in solving them.** MP.1
2. **Reason abstractly and quantitatively.** MP.2
3. **Construct viable arguments and critique the reasoning of others.** MP.3
4. **Model with mathematics** MP.4
5. **Use appropriate tools strategically** MP.5
6. **Attend to precision.** MP.6
7. **Look for and make use of structure.** MP.7
8. **Look for and express regularity in repeated reasoning.** MP.8

Geometry

Solve real-world and mathematical problems involving area, surface area, and volume.

1. Find the area of all triangles, special quadrilaterals (including parallelograms, kites and trapezoids), and polygons whose edges meet at right angles (rectilinear figure 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. 6.G.1
2. Find the volume of a right rectangular prism with fractional edge lengths by applying the formulas V=lwh and V=Bh (B is the area of the base and h is the height) to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. 6.G.2
3. Draw polygons whose edges meet at right angles (rectilinear figure 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. 6.G.3
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. 6.G.4

Skip to main content

Ra Relationships

nderstand ratio concepts and use ratio reasoning to solve problems.

1. Use ratio language to describe a relationship between two quantities. Distinguish between part-to-part and part-to-whole relationships. 6.RP.1
2. Use unit rate language ("for each one", "for every one" and "per") and unit rate notation to demonstrate understanding the concept of a unit rate a/b associated with a ratio a:b with b≠0, 6.RP.2
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 diagram, or using calculations.) 6.RP.3
    a. Make tables of equivalent ratios relating quantities with whole-number measurements, find the missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. Solve unit rate problems including those involving unit pricing and constant speed. 6.RP.3.A
    b. 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.RP.3.B
    c. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. 6.RP.3.C

The Number System

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, requiring multiple exposures connecting various concrete and abstract models. 6.NS.1

Compute fluently (efficiently, accurately, and flexibly) with multi-digit numbers and find common factors and multiples.

2. Fluently (efficiently, accurately, and flexibly) divide multi-digit numbers using an efficient algorithm. 6.NS.2
3. Fluently (efficiently, accurately, and flexibly) add, subtract, multiply, and divide multi-digit decimals using an efficient algorithm for each operation. 6.NS.3
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.4

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

5. Understand positive and negative numbers 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); 6.NS.5
    a. Use positive and negative numbers to represent quantities in real-world contexts, 6.NS.5.A
    b. Explaining the meaning of 0 in each situation. 6.NS.5.B

Skip to main content

6. Understand a rational number as a point on the number line and a coordinate pair as a location on a coordinate plane. 6.NS.6

   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. 6.NS.6.A

   b. Recognize signs of numbers in ordered pairs indicate 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. 6.NS.6.B

   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. 6.NS.6.C

7. Understand ordering and absolute value of rational numbers. 6.NS.7

   a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. 6.NS.7.A

   b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. 6.NS.7.B

   c. Explain 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. 6.NS.7.C

   d. Distinguish comparisons of absolute value from statements about order. 6.NS.7.D

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.NS.8

Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

1. Write and evaluate numerical expressions involving whole-number exponents. 6.EE.1

2. Write, read, and evaluate expressions in which letters stand for numbers. 6.EE.2

   a. Write expressions that record operations with numbers and with letters standing for numbers. 6.EE.2.A

   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. 6.EE.2.B

   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). 6.EE.2.C

Skip to main content

3. Apply the properties of operations and combine like terms, with the conventions of algebraic notation, to identify and generate equivalent expressions. 6.EE.3

Reason about and solve one-variable equations and inequalities.

4. 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.4
5. 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.5
6. Solve one-step equations involving non-negative rational numbers using addition, subtraction, multiplication and division. 6.EE.6
7. 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. 6.EE.7

Represent and analyze quantitative relationships between dependent and independent variables.

8. Use variables to represent two quantities in a real-world problem that change in relationship to one another. 6.EE.8
    a. Identify the independent and dependent variable. 6.EE.8.A
    b. 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. 6.EE.8.B
    c. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. 6.EE.8.C

Statistics and Probability

Develop concepts of statistical measures of center and variability and an informal understanding of outlier.

1. Recognize and generate a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. 6.SP.1
2. Analyze a set of data collected to answer a statistical question with a distribution which can be described by its center (mean, median and/or mode), spread (range and/or interquartile range), and overall shape (cluster, peak, gap, symmetry, skew (data) and/or outlier). 6.SP.2
3. Recognize that a measure of center (mean, median and/or mode) for a numerical data set summarizes all of its values with a single number, while a measure of variation (range and/or interquartile range) describes how its values vary with a single number. 6.SP.3

Skip to main content

ımmarize and describe distributions.

4. Display numerical data on dot plots, histograms, stem-and-leaf plots, and box plots. (6.SP.4) 6.SP.4

5. Summarize numerical data sets in relation to their context, such as by: 6.SP.5

    a. Reporting the number of observations. 6.SP.5.A

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

    c. Giving quantitative measures of center (mean, median and/or mode) and variability (range and/or interquartile range), 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.5.C

    d. Relating the choice of measures of center and variability to the distribution of the data. 6.SP.5.D