Common Core Math Grade 6

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	GRADE 6 SKILL	VOCABULARY	MATHEMATICAL PRACTICES	ASSESSMENT
How is geometry part of the world? How do we solve geometric problems? How do we use formulas? How do we compute fractions?	***Geometry 6.G*** Solve real-world and mathematical problems involving area, surface area, and volume. ***The Number System 6.NS*** Apply and extend previous understandings of multiplication and division to divide fractions by fractions. Compute fluently with multi-digit numbers and find common factors and multiples.	❑ Calculate the area of right triangles and other types of triangles. 6.G.1 ❑ Calculate the area of special quadrilaterals and polygons by composing them into rectangles or decomposing them into triangles. 6.G.1 ❑ Apply techniques of finding the area of polygons to solve real-world problems. 6.G.1 ❑ Calculate the volume of a right rectangular prism with fractional side lengths. 6.G.2 ❑ Compare finding the volume of a right rectangular prism by packing it with unit cubes to finding the volume by multiplying the side lengths. 6.G.2 ❑ Apply the formula of V = l x w x h and V = B x h to find the volume of right rectangular prisms with fractional side lengths to solve real-world problems. 6.G.2 ❑ Graph polygons in the coordinate plane given the vertices. 6.G.3 ❑ Calculate the length of a side of a polygon graphed in the coordinate plane where the vertices have the same x-value or same y-value. 6.G.3 ❑ Calculate the surface area of a 3-dimensional figure by using nets made up of rectangles and triangles. 6.G.4 ❑ Solve real-world problems involving surface area of 3-dimensional figures. 6.G.4 ❑ Compute quotients of fractions. 6.NS.1 ❑ Solve word problems involving the division of fractions 6.NS.1 ❑ Draw a visual fraction model to illustrate the quotient of two fractions. 6.NS.1 ❑ Apply the relationship between multiplication and division to justify your answer. 6.NS.1 ❑ Fluently divide multi-digit numbers using the standard algorithm. 6.NS.2 ❑ Add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. 6.NS.3 ❑ Compute the greatest common factor of two whole numbers less than or equal to 100. 6.NS.4 ❑ Compute the least common multiple of two whole numbers less than or equal to 12. 6.NS.4 ❑ Compute the greatest common factor of two whole numbers written as a sum. 6.NS.4 ❑ Apply the distributive property to rewrite the sum with the GCF written	▪ right triangle ▪ triangle ▪ quadrilaterals ▪ polygons ▪ area ▪ compose ▪ decompose ▪ volume ▪ right rectangular prism ▪ base ▪ width, height ▪ length ▪ coordinate plane ▪ vertices ▪ ordered pairs ▪ nets ▪ 3-dimensional figures ▪ surface area ▪ quotient ▪ fraction ▪ visual fraction model ▪ standard algorithm ▪ dividend ▪ divisor ▪ remainder ▪ quotient ▪ decimal ▪ place value ▪ product ▪ sum ▪ difference ▪ greatest common factor ▪ least common multiple ▪ distributive property ▪ compute ▪ whole numbers ▪ express	Make sense of problems and preserve in solving them. Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics. Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.	Integrated Performance Tasks http://palm.sri.com/ http://www.nctm.org

How do we use patterns to understand fractions? How do we compute mixed numbers?	Apply and extend previous understandings of numbers to the system of rational numbers. Apply and extend previous understandings of numbers to the system of rational numbers.	outside parentheses and the two whole numbers with no common factor written inside the parentheses 6.NS.4 ❑ Define positive and negative numbers in terms of direction and value. 6.NS.5 ❑ Describe real-world situations where positive and negative numbers are used. 6.NS.5 ❑ Explain the meaning of 0 with positive and negative integers. 6.NS.5 ❑ Locate opposite signed numbers on opposite sides of zero on a number line. 6.NS.6a ❑ Define the opposite of the opposite of a number is the number itself. 6.NS.6a ❑ Define the opposite of 0 as itself. 6.NS.6a ❑ Graph ordered pairs in a coordinate plane. 6.NS.6b ❑ Locate positive and negative numbers in a coordinate plane 6.NS.6b ❑ Describe that when two ordered pairs only differ by their signs, they are reflections across the x-axis, y-axis, or both axes. 6.NS.6b ❑ Identify the four quadrants on a coordinate plane. 6.NS.6b ❑ Plot and locate integers and rational numbers on vertical and horizontal number lines. 6.NS.6c ❑ Plot and locate integer and rational number pairs on the coordinate plane. 6.NS.6c ❑ Compare rational numbers on a number line. 6.NS.7a ❑ Describe statements of inequality on a number line. 6.NS.7a ❑ Plot two numbers on a number line to describe the relationship between them in terms of less than, greater than, or equal to. 6.NS.7a ❑ Write statements of order for rational numbers in real-world contexts. 6.NS.7b ❑ Explain statements of order for rational numbers in real-world contexts. 6.NS.7b ❑ Explain how positive and negative rational numbers are used in real-world contexts. 6.NS.7b ❑ Define the absolute value of a rational number as a distance from 0 on a number line. 6.NS.7c ❑ Explain the absolute value of a positive or negative quantity in a real-world situation as magnitude/length. 6.NS.7c ❑ Compare and contrast the absolute value of a rational number to ordering rational numbers. 6.NS.7d ❑ Define a number less than a negative number as having a greater distance from zero.6.NS.7d	▪ Positive ▪ Negative ▪ Opposite ▪ Zero ▪ Integer ▪ Elevation ▪ Sea level ▪ Credits/debits ▪ Deposits ▪ withdrawals ▪ Ascend/Descend ▪ opposite sign ▪ zero ▪ number line ▪ positive ▪ negative ▪ double negative ▪ ordered pairs ▪ coordinate plane ▪ x-axis ▪ y-axis ▪ reflection ▪ equidistant ▪ horizontal number line ▪ vertical number line ▪ integers ▪ rational numbers ▪ plot ▪ Inequality ▪ greater than ▪ less than ▪ equal to ▪ rational number ▪ temperature ▪ positive and negative charge ▪ absolute value/distance ▪ magnitude/length ▪ positive/negative quantities		

		❑ Graph points in all four quadrants 6.NS.8 ❑ Calculate the distance between two points graphed on a ❑ coordinate plane (vertical or horizontal lines only). 6.NS.8 ❑ Calculate the distance between two points with the same x-value or the same y-value. 6.NS.8	▪ ordered pairs ▪ coordinate plane ▪ quadrant		
	Statistics & Probability 6.SP Develop understanding of statistical variability.	❑ Identify statistical questions. 6.SP.1 ❑ Contrast statistical and non-statistical questions 6.SP.1 ❑ Define a statistical question as a question that allows for the gathering of variable data 6.SP.1 ❑ Describe a set of data in terms of its center (mean, median), spread (range, interquartile range, mean absolute deviation), and overall shape. 6.SP.2 ❑ Define measure of center for a data set as the summary of all its values as one number. 6.SP.3 ❑ Define measure of variation for a data set as how the data varies as one number 6.SP.3	▪ statistical question ▪ non-statistical question ▪ variability ▪ data ▪ Center ▪ Mean ▪ Median ▪ Spread ▪ Range ▪ interquartile range ▪ mean absolute deviation		
How do we organize data so that it is useful? How are graphs used?	Summarize and describe distributions	❑ Display numerical data as plots on a number line. 6.SP.4 ❑ Display numerical data as plots in a dot plot. 6.SP.4 ❑ Display numerical data in a histogram. 6.SP.4 ❑ Display numerical data in a box plot (box-and-whisker plot). 6.SP.4 ❑ Record the number of observations within a numerical data set. 6.SP.5a ❑ Describe how a data set was measured and its units of measurement. 6.SP.5b ❑ Calculate measures of center: median and/or mean 6.SP.5c ❑ Calculate measures of variability: interquartile range and/or mean absolute deviation 6.SP.5c ❑ Describe any overall patterns or deviations from the overall pattern in relation to the context of the data collection. 6.SP.5c ❑ Compare and contrast the measures of center to the data distribution in the context of the data collection 6.SP.5d ❑ Compare and contrast the measures of variability to the data distribution in the context of the data collection 6.SP.5d	▪ overall shape ▪ measure of center ▪ dot plot ▪ histogram ▪ box plot ▪ number line ▪ Observations ▪ data set ▪ units of measurement ▪ overall pattern ▪ median ▪ mean ▪ measures of center ▪ measures of variability ▪ data distribution ▪ context of data collection		
How do we identify mean, mode, median and range?	***Ratios & Proportional Relationships 6.RP*** Understand ratio concepts and use ratio reasoning to solve problems	❑ Describe relationships between two quantities using the concept of a ratio and vocabulary. 6.RP.1 ❑ Explain verbally the relationship between two quantities represented in a ratio. 6.RP.1 ❑ Convert a ratio to a unit rate written as a fraction. (denominator not equal to zero) 6.RP.2 ❑ Define a unit rate in terms of a ratio relationship. 6.RP.2	▪ ratio ▪ relationship ▪ quantities ▪ unit rate ▪ ratio relationship		

What is an interquartile range and an absolute deviation?		❑ Construct a table of equivalent ratios relating to whole-number measurement quantities. 6.RP.3a ❑ Compute the missing value in a table of equivalent ratios. 6.RP.3a ❑ Graph pairs of equivalent ratios on a coordinate plane. 6.RP.3a ❑ Compare two ratios using a table. 6.RP.3a ❑ Solve unit rate problems involving unit pricing. 6.RP.3b ❑ Solve unit rate problems involving constant speed. 6.RP.3b ❑ Write a proportion and solve problems with unit rates 6.RP.3b ❑ Write a percent as a fraction out of 100. 6.RP.3c ❑ Solve percent word problems to find the whole, given the part and percent 6.RP.3c ❑ Solve percent word problems by setting up a proportion. 6.RP.3c ❑ Solve percent word problems to find the part, given the whole and percent. 6.RP.3c ❑ Convert measurement units using ratios and proportions 6.RP.3d. ❑ Convert measurement units appropriately when multiplying quantities 6.RP.3d ❑ Convert measurement units appropriately when dividing quantities. 6.RP.3d	▪ table ▪ coordinate plane ▪ equivalent ratios ▪ x-coordinate /x-axis ▪ y-coordinate /y-axis ▪ constant speed ▪ unit pricing ▪ proportion ▪ part ▪ whole ▪ percent ▪ quantity ▪ fraction ▪ standard units of measurement ▪ customary units of measurement		
	Expressions & Equations 6.EE Apply and extend previous understandings of arithmetic to algebraic expressions.	❑ Evaluate numerical expressions with whole-number exponents. 6.EE.1 ❑ Write numerical expressions with whole-number exponents. 6.EE.1 ❑ Translate verbal expressions (word phrases) to algebraic expressions with letters standing for numbers. 6.EE.2a ❑ Identify parts of an expression using mathematical vocabulary. 6.EE.2b ❑ Evaluate expressions by substituting a numerical value for a variable. 6.EE.2c ❑ Simplify expressions using order of operations. 6.EE.2c ❑ Solve real-world problems with given a formula. 6.EE.2c ❑ Apply properties of operations to rewrite expressions. 6.EE.3 ❑ Explain why an expression that is rewritten is equivalent to the original expression. 6.EE.3 ❑ Identify when two expressions are equivalent (one expression is the simplified version of the other one). 6.EE.4 ❑ Explain why two expressions are equivalent regardless of the number that is substituted for the variable. 6.EE.4	▪ numerical expressions ▪ whole-number exponents ▪ verbal expressions ▪ algebraic expressions ▪ term ▪ product ▪ factor ▪ coefficient ▪ Formula ▪ order of operations ▪ Equivalent ▪ distributive property ▪ variable ▪ combine like terms ▪ equivalent expressions		
	Reason about and solve one-variable equations and inequalities.	❑ Solve an equation or inequality by determining for which values of a set make the equation or inequality true. 6.EE.5 ❑ Substitute a given number into an equation or inequality to see if it makes the equation/inequality true 6.EE.5	▪ equation ▪ Inequality ▪ Substitution ▪ Solution ▪ Expression ▪ Variable		

		❑ Write expressions with variables to represent numbers in a real-world problem. 6.EE.6 ❑ Define a variable as a representation of an unknown number or numbers in a set. 6.EE.6 ❑ Write and solve one-step equations with nonnegative rational numbers from real-world problems. 6.EE.7 ❑ Write an inequality to represent a real-world condition or constraint. 6.EE.8 ❑ Define inequalities as having infinitely many solutions 6.EE.8 ❑ Graph solutions to inequalities on number lines. 6.EE.8 ❑ Write an equation to represent two variables, one dependent and one independent. 6.EE.9 ❑ Analyze the relationship between independent and dependent variables using graphs, tables, and equations 6.EE.9 ❑ List and graph ordered pairs and write the equation to represent the relationship. 6.EE.9	▪ set (of numbers) ▪ nonnegative rational numbers ▪ one-step equations ▪ Constraint ▪ Condition ▪ Inequality ▪ solutions ▪ Table ▪ Independent ▪ Dependent ▪ ordered pairs ▪ constant		