California Common Core State Standards Comparison- SIXTH GRADE

Standards for Mathematical Practice

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

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
Number Sense *NS 1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers. Students solve problems involving fractions, ratios, proportions, and percents.	**Ratios and Proportional Relationships 6.RP** **-Understand ratio concepts and use ratio reasoning to solve problems.** **The Number System 6.NS** **-Apply and extend previous understandings of numbers to the system of rational numbers.** (Cluster Statements)	
*NS 1.1 Compare and order positive and negative fractions, decimals and mixed numbers and place them on a number line.	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. 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. 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. b. 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 locations of the points are related by reflections across one or both axes. 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.7. Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.* b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3°C > –7°C to express the fact that –3°C is warmer than –7°C.* c. Understand the absolute value of a rational number as its distance from 0 on the	

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
	number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.* d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.*	
*NS 1.2 Interpret and use in different context (batting average, miles per hour) to show the relative sizes of two quantities using appropriate notation (a/b, a to b, a:b)	6.RP.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* 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. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* (limited to non-complex fractions)	Also, 7.RP.1
*NS 1.3 Use proportions to solve problems (determine the value of "n" if 4 / 7 = n/ 21, find the length of a side of a polygon similar to a known polygon). Use cross multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse.		7.RP.2,3 and 7.G.1
*NS 1.4 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.	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. a. 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. b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* c. 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. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	Also 7.RP.3

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
*NS 2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division	**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.** **-Apply and extend previous understandings of numbers to the system of rational numbers.** **Expressions and Equations 6.EE** **Apply and extend previous understandings of arithmetic to algebraic expressions.** **(Cluster Statements)**	Also, 7.NS Cluster Statement
NS 2.1 Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation	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. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*	Also 5.NF.1,2,6
NS 2.2 Explain the meaning of multiplication and division of positive fractions and perform the calculations (e.g., $^{5}/_{8} \div {}^{15}/_{16} = {}^{5}/_{8} \times {}^{16}/_{15} = {}^{2}/_{3}$).		
*NS 2.3 Solve addition, subtraction, multiplication and division problems, including those arising in concrete situations, that use positive and negative integers and combinations of these operations	6.EE.3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.* 6.NS.2. Fluently divide multi-digit numbers using the standard algorithm. 6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	Also 7.NS.2 and 7.EE.3
*NS 2.4 Determine the least common multiple and the greatest common divisor of whole numbers; use them to solve problems with fractions (e.g., to find the common denominator to add two fractions or to find the reduced form for a fraction).	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. *For example, express 36 + 8 as 4 (9 + 2).*	Also 5.NF.1

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
	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.	
AF 1.0 Students write verbal expressions and sentences as algebraic expressions and equations; they evaluate algebraic expressions, solve simple linear equations, and graph and interpret their results	**Expressions and Equations 6.EE** **- Apply and extend previous understandings of arithmetic to algebraic expressions.** **-Reason about and solve one-variable equations and inequalities.** **(Cluster Statements)**	
*AF 1.1 Write and solve one-step linear equations in one variable	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.	
AF 1.2 Write and evaluate an algebraic expression for a given situation, using up to three variables	6.EE.1. Write and evaluate numerical expressions involving whole-number exponents. 6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.* 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. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.* 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). *For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2.* 6.EE.3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.* 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). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	
AF 1.3 Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process		
AF 1.4 Solve problems manually by using the correct order of operations or by using a scientific calculator		
	6.EE.5. Understand solving an equation or inequality as a process of answering a	

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
	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.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.	
AF 2.0 Students analyze and use tables, graphs, and rules to solve problems involving rates and proportions	**Ratios and Proportional Relationships 6.RP** **-Understand ratio concepts and use ratio reasoning to solve problems.** **(Cluster Statement)**	Also 7.RP.2
AF 2.1 Convert one unit of measurement to another	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. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* (limited to non-complex fractions) 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. a. 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. b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* c. 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. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	Also 5.MD.1
*AF 2.2 Demonstrate an understanding that rate is a measure of one quantity per unit value of another quantity.		Also 7.RP.2
AF 2.3 Solve problems involving rates, average speed, distance, and time		
AF 3.0 Students investigate geometric patterns and describe them algebraically	**Expressions and Equations 6.EE** **-Reason about and solve one-variable equations and inequalities.** **(Cluster Statement)** 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.	
AF 3.1 Use variables in expressions	6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers.	

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
describing geometric quantities (e.g., P = 2*w* + 2*l*, A = 1/2*bh*, circumference of a circle)	a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.* 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. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.* 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). *For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2.*	
AF 3.2 Express in symbolic form relationships arising from geometry		
	Expressions and Equations 6.EE **-Represent and analyze quantitative relationships between dependent and independent variables.** 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.*	
MG 1.0 Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems	**Geometry 6.G** **-Solve real-world and mathematical problems involving area, surface area, and volume.** **(Cluster Statement)**	
*MG 1.1 Understand the concept of a constant such as pi; know the formulas for the circumference and area of a circle.		
MG 1.2 Know common estimates of pi (3.14; $^{22}/_{7}$) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements.		

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
	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.	
MG 1.3 Know and use the formulas for the volume of triangular prisms and cylinders (area of base x height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid.	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 $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	Also 7.G.6 and 8.G.9
MG 2.0 Students identify and describe the properties of two-dimensional figures		5.G.3,4
MG 2.1 Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms		7.G.5
*MG 2.2 Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle		7.G.5
MG 2.3 Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle).		7.G.5
	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.	
	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.	

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
SDAP 1.0 Students compute and analyze statistical measurements for data sets	**Statistics and Probability 6.SP** **-Develop understanding of statistical variability.** **- Summarize and describe distributions.** (Cluster Statements)	
* SDAP 1.1 Compute the range, mean, median, and mode of data sets.	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. 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.	
*SDAP 1.2 Understand how additional data added to data sets may affect these computations of measures of central tendency.		Also 8.SP.1
*SDAP 1.3 Understand how the inclusion or exclusion of outliers affects measures of central tendency		
*SDAP 1.4 Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.	6.SP.5. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. 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 in which the data were gathered. d. 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.	
*SDAP 2.0 Students use data samples of a population and describe the characteristics and limitations of the samples:	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. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	
*SDAP 2.1 Compare different samples of a population with the data from the entire population		7.SP.1
*SDAP 2.2 Identify different ways of selecting a sample (convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a		7.SP.1

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
population		
	6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	
*SDAP 2.3Analyze data displays and explain why the way in which the question was asked might have influenced the results obtained and why the way in which the results were displayed might have influenced the conclusions reached.	6.SP.5. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. 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 in which the data were gathered. d. 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.	
*SDAP 2.4 Identify data that represent sampling errors and explain why the sample (and the display) might be biased.		
*SDAP 2.5 Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims.	Mathematical Practice 2 – Reason Abstractly and quantitatively. Mathematical Practice 3 – Construct viable arguments and critiques the reasoning of others.	
* SDAP 3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events:		7.SP.6, 7, 8
*SDAP 3.1 Represent all possible outcomes for compound event in an organized way (tables, grids, tree diagrams) and express theoretical probability of each outcome.		7.SP.8
*SDAP 3.2 Use data to estimate the probability of future events (batting averages or number of accidents per mile driven)		7.SP.6
*SDAP 3.3 Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and		7.SP.5

California Common Core State Standards Comparison- SIXTH GRADE

Current CA Math Content Standards	California Common Core State Standards – Mathematics	Notes
100 and verify that the probabilities computed are reasonable; know that if P is the probability of an event, 1-P is the probability of an event not occurring.		
**SDAP 3.4 Understand that the probability of either of two disjoint events occurring is the sum of the two individual probabilities and that the probability of one event following another, in independent trials is the product of the two probabilities		7.SP.8
**SDAP 3.5 Understand the difference between independent and dependent events		7.SP.8

***=Key Standards**