2013-14 CC-CA Math 8 BK (B195857)—Blueprint Summary

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						2013-2014 CA		2013-2014 CA	
					Status	Draft		Draft	
					# Standards Assessed	5		13	
					Number of Items per Standard (max)	4		1	
					Number of Items per Standard (min)	1		1	
					Number of Items per Standard (avg)	3.2		1.0	
Standard	**Description**	**CST #**	**CST %**	**Yr #**	**Yr %**	**#**	**%**	**#**	**%**
Total		**64.98**	**100%**	**29**	**100%**	**16**	**100%**	**13**	**100%**
California Item Bank									
MA.7.NS	Number Sense								
MA.7.NS.1.0	Students know the properties of, and compute with, rational numbers expressed in a variety of forms:								
MA.7.NS.1.1	Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.	1	1.5%						
MA.7.NS.1.2	Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.	4	6.2%						
MA.7.NS.1.3	Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.	1	1.5%						
MA.7.NS.1.4	Differentiate between rational and irrational numbers.	1	1.5%						
MA.7.NS.1.5	Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions.	1	1.5%						
MA.7.NS.1.6	Calculate the percentage of increases and decreases of a quantity.	1	1.5%						
MA.7.NS.1.7	Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest.	5	7.7%						
MA.7.NS.2.0	Students use exponents, powers, and roots and use exponents in working with fractions:								
MA.7.NS.2.1	Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.	1	1.5%						
MA.7.NS.2.2	Add and subtract fractions by using factoring to find common denominators.	1	1.5%						
MA.7.NS.2.3	Multiply, divide, and simplify rational numbers by using exponent rules.	3	4.6%						
MA.7.NS.2.4	Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why.	1	1.5%						
MA.7.NS.2.5	Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers.	2	3.1%						
MA.7.AF	Algebra and Functions								
MA.7.AF.1.0	Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs:								
MA.7.AF.1.1	Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A).	1	1.5%						
MA.7.AF.1.2	Use the correct order of operations to evaluate algebraic expressions such as $3(2x + 5)^2$.	1	1.5%						

MA.7.AF.1.3	Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used.	5	7.7%						
MA.7.AF.1.4	Use algebraic terminology (e.g., variable, equation, term, coefficient, inequality, expression, constant) correctly.	0.33	0.5%						
MA.7.AF.1.5	Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.	0.67	1.0%						
MA.7.AF.2.0	Students interpret and evaluate expressions involving integer powers and simple roots:								
MA.7.AF.2.1	Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents.	1	1.5%						
MA.7.AF.2.2	Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent.	1	1.5%						
MA.7.AF.3.0	Students graph and interpret linear and some nonlinear functions:								
MA.7.AF.3.1	Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems.	0.67	1.0%						
MA.7.AF.3.2	Plot the values from the volumes of three-dimensional shapes for various values of the edge lengths (e.g., cubes with varying edge lengths or a triangle prism with a fixed height and an equilateral triangle base of varying lengths).	0.33	0.5%						
MA.7.AF.3.3	Graph linear functions, noting that the vertical change (change in y-value) per unit of horizontal change (change in x-value) is always the same and know that the ratio ("rise over run") is called the slope of a graph.	2	3.1%						
MA.7.AF.3.4	Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities.	2	3.1%						
MA.7.AF.4.0	Students solve simple linear equations and inequalities over the rational numbers:								
MA.7.AF.4.1	Solve two-step linear equations and inequalities in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results.	5	7.7%						
MA.7.AF.4.2	Solve multistep problems involving rate, average speed, distance, and time or a direct variation.	5	7.7%						
MA.7.MG	Measurement and Geometry								
MA.7.MG.1.0	Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems:								
MA.7.MG.1.1	Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters).	0.67	1.0%						
MA.7.MG.1.2	Construct and read drawings and models made to scale.	0.33	0.5%						

MA.7.MG.1.3	Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.	3	4.6%						
MA.7.MG.2.0	Students compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects. They know how perimeter, area, and volume are affected by changes of scale:								
MA.7.MG.2.1	Use formulas routinely for finding the perimeter and area of basic two-dimensional figures and the surface area and volume of basic three-dimensional figures, including rectangles, parallelograms, trapezoids, squares, triangles, circles, prisms, and cylinders.	0.33	0.5%						
MA.7.MG.2.2	Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects.	0.33	0.5%						
MA.7.MG.2.3	Compute the length of the perimeter, the surface area of the faces, and the volume of a three-dimensional object built from rectangular solids. Understand that when the lengths of all dimensions are multiplied by a scale factor, the surface area is multiplied by the square of the scale factor and the volume is multiplied by the cube of the scale factor.	0.33	0.5%						
MA.7.MG.2.4	Relate the changes in measurement with a change of scale to the units used (e.g., square inches, cubic feet) and to conversions between units (1 square foot = 144 square inches or [1 ft^2] = [144 in^2], 1 cubic inch is approximately 16.38 cubic centimeters or [1 in^3] = [16.38 cm^3]).	0.33	0.5%						
MA.7.MG.3.0	Students know the Pythagorean theorem and deepen their understanding of plane and solid geometric shapes by constructing figures that meet given conditions and by identifying attributes of figures:								
MA.7.MG.3.1	Identify and construct basic elements of geometric figures (e.g., altitudes, mid-points, diagonals, angle bisectors, and perpendicular bisectors; central angles, radii, diameters, and chords of circles) by using a compass and straightedge.	0.33	0.5%						
MA.7.MG.3.2	Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections.	0.33	0.5%						
MA.7.MG.3.3	Know and understand the Pythagorean theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the Pythagorean theorem by direct measurement.	4	6.2%						
MA.7.MG.3.4	Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures.	2	3.1%						
MA.7.MG.3.5	Construct two-dimensional patterns for three-dimensional models, such as cylinders, prisms, and cones.								

MA.7.MG.3.6	Identify elements of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect).	1	1.5%						
MA.7.PS	Statistics, Data Analysis, and Probability								
MA.7.PS.1.0	Students collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set by hand and through the use of an electronic spreadsheet software program:								
MA.7.PS.1.1	Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data.	1	1.5%						
MA.7.PS.1.2	Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level).	1	1.5%						
MA.7.PS.1.3	Understand the meaning of, and be able to compute, the minimum, the lower quartile, the median, the upper quartile, and the maximum of a data set.	3	4.6%						
MA.7.MR	Mathematical Reasoning								
MA.7.MR.1.0	Students make decisions about how to approach problems:								
MA.7.MR.1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.								
MA.7.MR.1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.								
MA.7.MR.1.3	Determine when and how to break a problem into simpler parts.								
MA.7.MR.2.0	Students use strategies, skills, and concepts in finding solutions:								
MA.7.MR.2.1	Use estimation to verify the reasonableness of calculated results.								
MA.7.MR.2.2	Apply strategies and results from simpler problems to more complex problems.								
MA.7.MR.2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.								
MA.7.MR.2.4	Make and test conjectures by using both inductive and deductive reasoning.								
MA.7.MR.2.5	Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.								
MA.7.MR.2.6	Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.								
MA.7.MR.2.7	Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.								
MA.7.MR.2.8	Make precise calculations and check the validity of the results from the context of the problem.								

MA.7.MR.3.0	Students determine a solution is complete and move beyond a particular problem by generalizing to other situations:								
MA.7.MR.3.1	Evaluate the reasonableness of the solution in the context of the original situation.								
MA.7.MR.3.2	Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.								
MA.7.MR.3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.								
Common Core Item Bank									
Introduction	Introduction								
MA.8.1	Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions (y/x = m or y = mx) as special linear equations (y = mx + b), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount m·A. Students also use a linear equation to describe the association between two quantities in bivariate data (such as arm span vs. height for students in a classroom). At this grade, fitting the model, and assessing its fit to the data are done informally. Interpreting the model in the context of the data requires students to express a relationship between the two quantities in question and to interpret components of the relationship (such as slope and y-intercept) in terms of the situation. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation. Students solve systems of two linear equations in								
MA.8.2	Students grasp the concept of a function as a rule that assigns to each input exactly one output. They understand that functions describe situations where one quantity determines another. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations.								

MA.8.3	Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students understand the statement of the Pythagorean Theorem and its converse, and can explain why the Pythagorean Theorem holds, for example, by decomposing a square in two different ways. They apply the Pythagorean Theorem to find distances between points on the coordinate plane, to find lengths, and to analyze polygons. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.								
MA.8.NS	The Number System								
MA.8.NS.A	Know that there are numbers that are not rational, and approximate them by rational numbers.								
MA.8.NS.A.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.			1	3.4%			1	7.7%
MA.8.NS.A.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., pi^2).			1	3.4%			1	7.7%
MA.8.EE	Expressions and Equations								
MA.8.EE.A	Work with radicals and integer exponents.								
MA.8.EE.A.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions.			4	13.8%	4	25.0%		
MA.8.EE.A.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that the square root of 2 is irrational.			1	3.4%			1	7.7%
MA.8.EE.A.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.			3	10.3%	3	18.8%		
MA.8.EE.A.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.			4	13.8%	4	25.0%		
MA.8.EE.B	Understand the connections between proportional relationships, lines, and linear equations.								
MA.8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.								

MA.8.EE.B.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.								
MA.8.EE.C	Analyze and solve linear equations and pairs of simultaneous linear equations.								
MA.8.EE.C.7	Solve linear equations in one variable.			1	3.4%	1	6.3%		
MA.8.EE.C.7.a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).			1	3.4%			1	7.7%
MA.8.EE.C.7.b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.			1	3.4%			1	7.7%
MA.8.EE.C.8	Analyze and solve pairs of simultaneous linear equations.								
MA.8.EE.C.8.a	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.								
MA.8.EE.C.8.b	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.								
MA.8.EE.C.8.c	Solve real-world and mathematical problems leading to two linear equations in two variables.								
MA.8.F	Functions								
MA.8.F.A	Define, evaluate, and compare functions.								
MA.8.F.A.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.			1	3.4%			1	7.7%
MA.8.F.A.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).			1	3.4%			1	7.7%
MA.8.F.A.3	Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.			1	3.4%			1	7.7%
MA.8.F.B	Use functions to model relationships between quantities.								
MA.8.F.B.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.			1	3.4%			1	7.7%
MA.8.F.B.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.			5	17.2%	4	25.0%	1	7.7%
MA.8.G	Geometry								

MA.8.G.A	Understand congruence and similarity using physical models, transparencies, or geometry software.								
MA.8.G.A.1	Verify experimentally the properties of rotations, reflections, and translations:								
MA.8.G.A.1.a	Lines are taken to lines, and line segments to line segments of the same length.								
MA.8.G.A.1.b	Angles are taken to angles of the same measure.								
MA.8.G.A.1.c	Parallel lines are taken to parallel lines.								
MA.8.G.A.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.								
MA.8.G.A.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.								
MA.8.G.A.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.								
MA.8.G.A.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.								
MA.8.G.B	Understand and apply the Pythagorean Theorem.								
MA.8.G.B.6	Explain a proof of the Pythagorean Theorem and its converse.			1	3.4%			1	7.7%
MA.8.G.B.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.			1	3.4%			1	7.7%
MA.8.G.B.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.			1	3.4%			1	7.7%
MA.8.G.C	Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.								
MA.8.G.C.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.								
MA.8.SP	Statistics and Probability								
MA.8.SP.A	Investigate patterns of association in bivariate data.								
MA.8.SP.A.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.								
MA.8.SP.A.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.								
MA.8.SP.A.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.								

MA.8.SP.A.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.								

Key:
Orange: This standard has 6 or more items on the assessment.
Purple: This standard has 26 or more items on the blueprint.