Analysis of *California Mathematics* standards to *Common Core* standards- Kindergarten

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
Strand Number Sense	**CA Math Standard**				
1.0 Number Sense	1.0 Students understand the relationship between numbers and quantities (i.e., that a set of objects has the same number of objects in different situations regardless of its position or arrangement).	Counting and Cardinality	K.CC: Know number names and the counting sequence. K.CC: Count to tell the number of objects. Compare numbers. (Cluster Statement)	Yes	
	1.1 Compare two or more sets of objects (up to ten objects in each group) and identify which set is equal to, more than, or less than the other.	Counting and Cardinality	K.CC.6: Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.* K.CC.7: Compare two numbers between 1 and 10 presented as written numerals.	Yes	*Note: Include groups up to ten objects.
	1.2 Count, recognize, represent, name, and order a number of objects (up to 30).	Counting and Cardinality	K.CC.1: Count to 100 by ones and by tens. K.CC.2: Count forward beginning from a given number within the known sequence (instead of having to begin at 1). K.CC.3: Write numbers from 0–20. Represent a number of objects with written numeral 0 -20 (with 0 representing a count of no objects). K.CC.5: Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as	Partial	CCS has students count to 30 and by ones and twos, but represent and write numbers to 20 instead of 30(CA). CCS has students compare two numbers (written) but does not mention ordering numbers.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
			many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects		
	1.3 Know that the larger numbers describe sets with more objects in them than the smaller numbers have.	Counting and Cardinality	K.CC.4: Understand the relationship between numbers and quantities; connect counting to cardinality. K.CC.4a: When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. K.CC.4b: Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. **K.CC.4c: Understand that each successive number name refers to a quantity that is one larger.** **K.CC.6: Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.***	Yes	
2.0 Number Sense	2.0 Students understand and describe simple additions and subtractions.	Operations and Algebraic Thinking	K.OA: (Cluster Statement) Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	2.1 Use concrete objects to determine the answers to addition and subtraction problems (for two numbers that are each less than 10).	Operations and Algebraic Thinking	K.OA.1: Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions or equations. K.OA.2: Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	Yes	*Note: Drawings need not show details, but should show the mathematics in the problem.
3.0 Number Sense	3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones and tens places.			No	CCS does not mention estimation of quantities except in the Mathematical Practice standards. Estimation is then described as "make conjectures about the form and meaning of the solution and detect possible errors by strategically using estimation and other mathematical knowledge."
	3.1 Recognize when an estimate is reasonable.			No	CCS does not mention estimation of quantities except in the Mathematical Practice standards. Estimation is then described as "make conjectures about the form and meaning of the solution and detect possible errors by strategically using estimation and other mathematical knowledge."
Strand **Algebra and Functions**	**CA Math Standard**				
1.0 Algebra and Functions	1.0 Students sort and classify objects.	Measurement and Data	K.MD: Describe and compare measurable attributes.	Yes	
	1.1 Identify, sort, and classify objects by attribute and identify objects that do not belong to a particular group (e.g., all these balls are green, those are red).	Measurement and Data	K.MD.3: Classify objects into given categories; count the numbers of object in each category and sort the categories by count*.	Yes	*Note: Limit category counts to be less than or equal to 10.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
Strand Measurement and Geometry	**CA Math Standard**				
1.0 Measurement and Geometry	1.0 Students understand the concept of time and units to measure it; they understand that objects have properties, such as length, weight, and capacity, and that comparisons may be made by referring to those properties.	Measurement and Data	K.MD: Describe and compare measurable attributes. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Cluster Statements)	Partial	1.MD: (Cluster statement) Tell and write time.
	1.1 Compare the length, weight, and capacity of objects by making direct comparisons with reference objects (e.g., note which object is shorter, longer, taller, lighter, heavier, or holds more).	Measurement and Data	K.MD.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.MD.2: Directly compare two objects with a measurable attribute in common, to see which object has "more of/less of" the attribute, and describe the difference.	Yes	
	1.2 Demonstrate an understanding of concepts of time (e.g., morning, afternoon, evening, today, yesterday, tomorrow, week, year) and tools that measure time (e.g., clock, calendar).			No	1.MD.3: Tell and write time in hours and half-hours using analog and digital clocks.
	1.3 Name the days of the week.			No	
	1.4 Identify the time (to the nearest hour) of everyday events (e.g., lunch time is 12 o'clock; bedtime is 8 o'clock at night).			No	1.MD.3: Tell and write time in hours and half-hours using analog and digital clocks.
2.0 Measurement and Geometry	2.0 Students identify common objects in their environment and describe the geometric features.	Geometry	K.G: Identify and describe shapes (squares, circles, triangle, rectangle, hexagons, cubes, cones cylinders, and spheres). (Cluster Statement)	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	2.1 Identify and describe common geometric objects (e.g., circle, triangle, square, rectangle, cube, sphere, cone).	Geometry	K.G.2: Correctly name shapes regardless of their orientation or overall size.	Yes	
	2.2 Compare familiar plane and solid objects by common attributes (e.g., position, shape, size, roundness, number of corners).	Geometry	K.G.2: Correctly name shapes regardless of their orientation or overall size. K.G.4: Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, difference, parts (e.g., number of sides and vertices/"corners") and other attribute (e.g., having sides of equal length).	Yes	
Strand Statistics, Data Analysis, and Probability	**CA Math Standard**				
1.0 Statistics, Data Analysis, and Probability	1.0 Students collect information about objects and events in their environment.			No	1.MD: (Cluster Statement) Represent and interpret data.
	1.1 Pose information questions; collect data; and record the results using objects, pictures, and picture graphs.			No	1.MD.4: Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
	1.2 Identify, describe, and extend simple patterns (such as circles or triangles) by referring to their shapes, sizes, or colors.				CCS does not mention patterns except in the Mathematical Practice Standards,: "mathematically proficient students look closely to discern a pattern or structure (in problem solving.)

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
Strand Mathematical Reasoning	**CA Math Standard**				
1.0 Mathematical Reasoning	1.0 Students make decisions about how to set up a problem.	Mathematical Practice Standards	K.MP.1: Make sense of problems and persevere in solving them.	Yes	
	1.1 Determine the approach, materials, and strategies to be used.	Mathematical Practice Standards	K.MP.5: Use appropriate tools strategically.	Yes	
	1.2 Use tools and strategies, such as manipulatives or sketches, to model problems.	Mathematical Practice Standards	K.MP.4: Model with mathematics. K.MP.5: Use appropriate tools strategically.	Yes	
2.0 Mathematical Reasoning	2.0 Students solve problems in reasonable ways and justify their reasoning.	Mathematical Practice Standards	K.MP.3: Construct viable arguments and critique the reasoning of others.	Yes	
	2.1 Explain the reasoning used with concrete objects and/or pictorial representations.	Mathematical Practice Standards	K.MP.4: Model with mathematics.	Yes	
	2.2 Make precise calculations and check the validity of the results in the context of the problem.	Mathematical Practice Standards	K.MP.6: Attend to precision.	Yes	

Kindergarten Common Core Standards not found in Kindergarten CA Mathematics Standards

Domain	Common Core standard	Found in CA Math standards
Counting and Cardinality	K.CC.4a: When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only object.	No
Counting and Cardinality	K.CC.4b: Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.	No
Operations and Algebraic Thinking	K.OA.3: Decompose numbers less that or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5=2+3 and 5=4+1).	Yes Grade One NS1.3
Operations and Algebraic Thinking	K.OA.4: For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.	No
Operations and Algebraic Thinking	K.OA.5: Fluently add and subtract numbers within 5.	Partial Grade One NS2.1
Number and Operations in Base Ten	K.NBT.1: Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18=10+8); understand the these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	Yes Grade One NS3.4
Geometry	K.G.1: Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind and next to.*	Yes Grade One MG2.4
Geometry	K.G.3: Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").	No
Geometry	K.G.4: Analyze and compare two- and three-dimensional shapes, in different size and orientations, using informal language to describe their similarities, difference, parts(e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).	Yes Grade One MG2.2
Geometry	K.G.5: Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	No
Geometry	K.G.6: Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*	Yes Grade Two MG2.2

Kindergarten CA Mathematics Standards not found in the Kindergarten Common Core Standards

Strand	CA Math Standard	Found in Common Core Standards
3.0 Number Sense	3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones and tens places:	No. CCS does not mention estimation of quantities except in the Mathematical Practice standards. Estimation is then described as "make conjectures about the form and meaning of the solution and detect possible errors by strategically using estimation and other mathematical knowledge."
3.0 Number Sense	3.1 Recognize when an estimate is reasonable.	No. CCS does not mention estimation of quantities except in the Mathematical Practice standards. Estimation is then described as "make conjectures about the form and meaning of the solution and detect possible errors by strategically using estimation and other mathematical knowledge."
1.0 Measurement and Geometry	1.2 Demonstrate an understanding of concepts of time (e.g., morning, afternoon, evening, today, yesterday, tomorrow, week, year) and tools that measure time (e.g., clock, calendar).	Yes. 1.MD.3: Tell and write time in hours and half-hours using analog and digital clocks.
1.0 Measurement and Geometry	1.3 Name the days of the week.	No
1.0 Measurement and Geometry	1.4 Identify the time (to the nearest hour) of everyday events (e.g., lunch time is 12 o'clock; bedtime is 8 o'clock at night).	Yes. 1.MD.3: Tell and write time in hours and half-hours using analog and digital clocks.
1.0 Statistics Data Analysis, and Probability	1.0 Students collect information about objects and events in their environment.	Yes. 1.MD: (Cluster Statement) Represent and interpret data.
1.0 Statistics Data Analysis, and Probability	1.1 Pose information questions; collect data; and record the results using objects, pictures, and picture graphs.	Yes. 1.MD.4: Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Analysis of *California Mathematics* standards to *Common Core* standards-Grade 1

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
Strand Number Sense	**CA Math Standard**				
1.0 Number Sense	1.0 Students understand and use numbers up to 100.	Number and Operations in Base Ten	1.NBT: Extend the counting sequence. (Cluster Statement)	Yes	
	1.1 Count, read, and write whole numbers to 100.	Number and Operations in Base Ten	1.NBT.1: Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	Yes	
	1.2 Compare and order whole numbers to 100 by using the symbols for less than, equal to, or greater than (<, =, >).	Number and Operations in Base Ten	1.NBT.3: Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	Yes	
	1.3 Represent equivalent forms of the same number through the use of physical models, diagrams, and number expressions (to 20) (e.g., 8 may be represented as 4 + 4, 5 + 3, 2 + 2 + 2 + 2, 10 -2, 11 -3).	Operations and Algebraic Thinking	1.OA.6: Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on: making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one know 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).	Yes	
	1.4 Count and group object in ones and tens (e.g., three groups of 10 and 4 equals 34, or 30 + 4).	Number and Operations in Base Ten	1.NBT.2: Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
			a. 10 can be thought of as a bundle of ten ones-called a "ten". b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).		
	1.5 Identify and know the value of coins and show different combinations of coins that equal the same value.			No	2.MD.8: Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using dollar signs and cents sign appropriately CCS does not introduce money in first grade. The second grade standard does expect knowledge of value and then computation.
2.0 Number Sense	2.0 Students demonstrate the meaning of addition and subtraction and use these operations to solve problems.	Operations and Algebraic Thinking	1.OA: Represent and solve problems involving addition and subtraction. (Cluster Statement)	Yes	
	2.1 Know the addition facts (sums to 20) and the corresponding subtraction facts and commit them to memory.	Operations and Algebraic Thinking	1.OA.6: Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on: making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one know $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).	Partial	2.OA.2: Fluently add and subtract within 20 using mental strategies.* By end of Grade 2, know from memory all sums of two one-digit numbers.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	2.2 Use the inverse relationship between addition and subtraction to solve problems.	Operations and Algebraic Thinking	1.OA.4: Understand subtraction as an unknown-addend problem.	Yes	
	2.3 Identify one more than, one less than, 10 more than, and 10 less than a given number.	Number and Operations in Base Ten	1.NBT.5: Given a two-digit number, mentally find 10 more or 10 less that the number, without having to count: explain the reasoning used.	Yes	
	2.4 Count by 2s, 5s, and 10s to 100.	Counting and Cardinality Operations and Algebraic Thinking	1.OA.5: Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	Partial	K.CC.1: Count to 100 by ones and by tens. 2.NBT.2: Count within 1000; by 5s, 10s, and 100s.
	2.5 Show the meaning of addition (putting together, increasing) and subtraction (taking away, comparing, finding the difference).			No	K.OA: (Cluster Statement) Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
	2.6 Solve addition and subtraction problems with one-and two-digit numbers (e.g., 5 + 58 = __).	Number and Operations in Base Ten	1.NBT.4: Add within 100, including adding a two-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; related the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. 1.NBT.6: Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
			models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; related the strategy to a written method and explain the reasoning used.		
	2.7 Find the sum of three one-digit numbers.	Operations and Algebraic Thinking	1.OA.2: Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. 1OA.8: Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers.	Yes	
3.0 Number Sense	3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, and hundreds places.			No	CCS does not mention estimation of quantities except in the Mathematical Practice standards. Estimation is then described as "make conjectures about the form and meaning of the solution and detect possible errors by strategically using estimation and other mathematical knowledge."
	3.1 Make reasonable estimates when comparing larger or smaller numbers.			No	CCS does not mention estimation of quantities except in the Mathematical Practice standards. Estimation is then described as "make conjectures about the form and meaning of the solution and detect possible errors by strategically using estimation and other mathematical knowledge."

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
Strand Algebra and Function	**CA Math Standard**				
1.0 Algebra and Functions	1.0 Students use number sentences with operational symbols and expressions to solve problems.		1.OA: Represent and solve problems involving addition and subtraction. (Cluster Statement)	Yes	
	1.1 Write and solve number sentences from problem situations that express relationships involving addition and subtraction.		1.OA.1: Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting, together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.*	Yes	*Refers to table with common addition and subtraction situations (e.g., Add to and Take from with result unknown, change unknown, start unknown, etc.).
	1.2 Understand the meaning of the symbols +, -, =.	Operations and Algebraic Thinking	1.OA.7: Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.	Yes	
	1.3 Create problem situations that might lead to given number sentences involving addition and subtraction.			No	
Strand Measurement and Geometry	**CA Math Standard**				
1.0 Measurement and Geometry	1.0 Students use direct comparison and nonstandard units to describe the measurements of objects.	Measurement and Data	1.MD: Measure lengths indirectly and by iterating length units. (Cluster Statement)	Yes	
	1.1 Compare the length, weight, and volume of two or more objects by using direct comparison or a nonstandard unit.	Measurement and Data	1.MD.1: Order three objects by length; compare the lengths of two objects indirectly by using a third object. 1.MD.2: Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit)	Partial	3MD.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).* Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
			end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*		drawings (such as a beaker with a measurement scale) to represent the problem.* *Excludes compound units cm^3 and finding the geometric volume of a container • Excludes multiplicative comparison problems (problems involving notions of "times as much"; see glossary table dealing with common multiplication and division situations.)
	1.2 Tell time to the nearest half hour and relate time to events (e.g., before/after, shorter/longer).	Measurement and Data	1.MD.3: Tell and write time in hours and half-hours using analog and digital clocks.	Yes	
2.0 Measurement and Geometry	2.0 Students identify common geometric figures, classify them by common attributes, and describe their relative position or their location in space.	Geometry	1.G: Reason with shapes and their attributes. (Cluster Statement).	Yes	
	2.1 Identify, describe, and compare triangles, rectangles, squares, and circles, including the faces of three-dimensional objects.			No	K.G.4: Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
	2.2 Classify familiar plane and solid objects by common attributes, such as color, position, shape, size, roundness, or number of corners, and explain which attributes are being used for classification.	Geometry	1.G.1: Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	Yes	
	2.3 Give and follow directions about location.			No	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	2.4 Arrange and describe objects in space by proximity, position, and direction (e.g., near, far, below, above, up, down, behind, in front of, next to, left or right of).			No	K.G.1: Describe objects in the environment using names of shapes and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind, and next to.*
Strand Statistics, Data Analysis, and Probability	**CA Math Standard**				
1.0 Statistics, Data Analysis, and Probability	1.0 Students organize, represent, and compare data by category on simple graphs and charts.	Measurement and Data	1.MD: Represent and interpret data (Cluster Statement).	Yes	
	1.1 Sort objects and data by common attributes and describe the categories.			No	K.MD.3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
	1.2 Represent and compare data (e.g., largest, smallest, most often, least often) by using pictures, bar graphs, tally charts, and picture graphs.	Measurement and Data	1.MD.4: Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	Yes	
2.0 Statistics, Data Analysis, and Probability	2.0 Students sort objects and create and describe patterns by numbers, shapes, sizes, rhythms, or colors.			No	CCS mentions patterns in the Mathematical Practice Standards: "mathematically proficient students look closely to discern a pattern or structure."
	2.1 Describe, extend, and explain ways to get to a next element in simple repeating patterns (e.g., rhythmic, numeric, color, and shape).			No	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
Strand Mathematical Reasoning	**CA Math Standard**				
1.0 Mathematical Reasoning	1.0 Students make decisions about how to set up a problem.	Mathematical Practice Standards	1.MP.1: Make sense of problems and persevere in solving them.	Yes	
	1.1 Determine the approach, materials, and strategies to be used.	Mathematical Practice Standards	1.MP.5: Use appropriate tools strategically.	Yes	
	1.2 Use tools, such as manipulatives or sketches, to model problems.	Mathematical Practice Standards	1.MP.4: Model with mathematics. 1.MP.5: Use appropriate tools strategically.	Yes	
2.0 Mathematical Reasoning	Students solve problems and justify their reasoning	Mathematical Practice Standards	1.MP.3: Construct viable arguments and critique the reasoning of others.	Yes	
	2.1 Explain the reasoning used and justify the procedures selected.	Mathematical Practice Standards	1.MP.4: Model with mathematics.	Yes	
	2.2 Make precise calculations and check the validity of the results from the context of the problem.	Mathematical Practice Standards	1.MP.6: Attend to precision.	Yes	
3.0 Mathematical Reasoning	3.0 Students note connections between one problem and another.	Mathematical Practice Standards	1.MP.7: Look for and make use of structure. 1.MP.8: Look for and express regularity in repeated reasoning.	Yes	

Grade 1 Common Core Standards not found in Grade 1 CA Mathematics Standards

Domain	Common Core standard	Found in CA Math standards
Operations and Algebraic Thinking	1.OA.3: Apply properties of operations as strategies to add and subtract (*Students need not use formal terms for these properties). Examples: If 8 + 3 = 11 is known, 3 + 8 = 11 is also known. (Commutative property of addition). To add 2 + 6+ 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12 (Associative property of addition).	Yes Grade Two AF1.1
Geometry	1.G.2: Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape (*Students do not need to learn formal names).	Yes Grade Two MG2.2
Geometry	1.G.3: Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal share creates smaller shares.	Yes Grade Two NS4.1, NS4.2, NS4.3

Grade 1 CA Mathematics Standards not found in the Grade 1 Common Core Standards

Strand	CA Math Standard	Found in Common Core Standards
1.0 Number Sense	1.5 Identify and know the value of coins and show different combinations of coins that equal the same value.	Yes. 2.MD.8: Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using dollar signs and cents sign appropriately
2.0 Number Sense	2.5 Show the meaning of addition (putting together, increasing) and subtraction (taking away, comparing, finding the difference).	K.OA: (Cluster Statement) Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
3.0 Number Sense	3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, and hundreds places	No. CCS does not mention estimation of quantities except in the Mathematical Practice standards. Estimation is then described as "make conjectures about the form and meaning of the solution and detect possible errors by strategically using estimation and other mathematical knowledge."
3.0 Number Sense	3.1 Make reasonable estimates when comparing larger or smaller numbers.	No. CCS does not mention estimation of quantities except in the Mathematical Practice standards. Estimation is then described as "make conjectures about the form and meaning of the solution and detect possible errors by strategically using estimation and other mathematical knowledge."
1.0 Algebra and Functions	1.3 Create problem situations that might lead to given number sentences involving addition and subtraction.	No.
2.0 Measurement and Geometry	2.1 Identify, describe, and compare triangles, rectangles, squares, and circles, including the faces of three-dimensional objects.	Yes. K.G.4: Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
2.0 Measurement and Geometry	2.3 Give and follow directions about location.	No.

Strand	CA Math Standard	Found in Common Core Standards
2.0 Measurement and Geometry	2.4 Arrange and describe objects in space by proximity, position, and direction (e.g., near, far, below, above, up, down, behind, in front of, next to, left or right of).	Yes. K.G.1: Describe objects in the environment using names of shapes and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind, and next to.*
1.0 Statistics, Data Analysis, and Probability	1.1 Sort objects and data by common attributes and describe the categories.	Yes. K.MD.3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
2.0 Statistics, Data Analysis, and Probability	2.0 Students sort objects and create and describe patterns by numbers, shapes, sizes, rhythms, or colors	No. CCS mentions patterns in the Mathematical Practice Standards: "mathematically proficient students look closely to discern a pattern or structure."
2.0 Statistics, Data Analysis, and Probability	2.1 Describe, extend, and explain ways to get to a next element in simple repeating patterns (e.g., rhythmic, numeric, color, and shape).	No.

Analysis of *California Mathematics* standards to *Common Core* standards-Grade 2

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
Strand Number Sense	**CA Math Standard**				
1.0 Number Sense	1.0 Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000.	Numbers and Operations in Base Ten	2.NBT: Understand Place Value. Use place value understanding and properties of operations to add and subtract. (Cluster Statement)	Yes	

	1.1 Count, read, and write whole numbers to 1,000 and identify the place value for each digit.	Numbers and Operations in Base Ten	2.NBT.1: Understand that the three-digit number represent amounts of hundreds, tens and ones; e.g. 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
			  2.NBT.1a: 100 can be thought of as a bundle of ten tens-called a "hundred."
			  2.NBT.1b: The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
			
			2.NBT.2: Count within 1000; skip-count by 5s, 10s and 100s.
			
			2.NBT.3: Read and write numbers to 1000 using base-ten numerals, number names and expanded form.
				Yes	

	1.2 Use words, models, and expanded forms (e.g., 45 = 4 tens + 5) to represent numbers (to 1,000).	Numbers and Operations in Base Ten	2.NBT.3: Read and write numbers to 1000 using base-ten numerals, number names and expanded form.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.3 Order and compare whole numbers to 1,000 by using the symbols <, =, >.	Numbers and Operations in Base Ten	2.NBT.4: Compare two three-digit numbers based on meanings of the hundreds, tens and ones digits, using >, =, and < symbols to record the results of the comparisons.	Yes	
2.0 Number Sense	2.0 Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers.	Numbers and Operations in Base Ten	2.NBT.1: (Cluster Statement) Use place value understanding and properties of operations to add and subtract.	Yes	
	2.1 Understand and use the inverse relationship between addition and subtraction (e.g., an opposite number sentence for 8 + 6 = 14 is 14 − 6 = 8) to solve problems and check solutions.	Numbers and Operations in Base Ten	2.NBT.5: Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 2.NBT.7: Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. 2.NBT.9: Explain why addition and subtraction strategies work, using place value and the properties of operations.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	2.2 Find the sum or difference of two whole numbers up to three digits long.	Numbers and Operations in Base Ten	2.NBT.6: Add up to four two-digit numbers using strategies based on place value and properties of operations. 2.NBT.7: Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	Yes	
	2.3 Use mental arithmetic to find the sum or difference of two two-digit numbers.	Operations and Algebraic Thinking	2.OA.1: Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using drawing and equations with a symbol for the unknown number to represent the problem. 2.OA.2: Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers.	Yes	
		Number and Operations in Base Ten	2.NBT.5: Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.		

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			2.NBT.8: Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.		
3.0 Number Sense	3.0 Students model and solve simple problems involving multiplication and division.			No	2.OA: (Cluster Statement) Represent and solve problems involving multiplication and division.
	3.1 Use repeated addition, arrays, and counting by multiples to do multiplication.	Operations and Algebraic Thinking	2.OA.4: Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	Partial	3.OA.3: Use multiplication and division with 100 to solve word problem in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

CCS only looks at arrays up to 5 by 5. CCS does not mention counting by multiples. |
	3.2 Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division.			No	3.OA.3: Use multiplication and division with 100 to solve word problem in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
	3.3 Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory.			No	3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one know 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
4.0 Number Sense	4.0 Students understand that fractions and decimals may refer to parts of a set and parts of a whole.			No	3.NF: Develop an understanding of fractions as numbers. (Cluster Statement)

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					CCS does not mention parts of sets, nor does it mention decimals.
	4.1 Recognize, name, and compare unit fractions from ½ to 1/12.			No	3.NF.1: Understand a fraction *1/b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by a parts of size *1/b*. 3.NF.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram. CCS does not name the specific fractions and uses the number line to identify.
	4.2 Recognize fractions of a whole and parts of a group (e.g., one-fourth of a pie, two-thirds of 15 balls).			No	3.NF.1: Understand a fraction *1/b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by a parts of size *1/b*. CCS does not mention parts of groups.
	4.3 Know that when all fractional parts are included, such as four-fourths, the result is equal to the whole and to one.	Geometry	2.G.3: Partition circles and rectangles into two, three, or four equal shares, describe the shares using words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	Yes	
5.0 Number Sense	5.0 Students model and solve problems by representing, adding, and subtracting amounts of money.	Measurement and Data	2.MD: Work with time and money. (Cluster Statement)	Yes	
	5.1 Solve problems using combinations of coins and bills.	Measurement and Data	2.MD.8: Solve word problems involving dollar bills, quarters, dimes, nickels and pennies, using dollar and cent symbols appropriately.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	5.2 Know and use the decimal notation and the dollar and cent symbols for money.			No	Decimal notation occurs in Grade 4 of the CCS, but not in relation to money.
6.0 Number Sense	6.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places.			No	CCS does not reference estimation directly. In the Mathematical Practice standards, CCS implies a thorough understanding of the concepts so students could develop strong estimation skills as a byproduct of the depth of understanding.
	6.1 Recognize when an estimate is reasonable in measurements (e.g., closest inch).			No	
Strand Algebra and Functions	**CA Math Standard**				
1.0 Algebra and Functions	1.0 Students model, represent, and interpret number relationships to create and solve problems involving addition and subtraction.			No	3.OA: (Cluster Statement) Represent and solve problems involving addition and subtraction.
	1.1 Use the commutative and associative rules to simplify mental calculations and to check results.			No	3.OA.5: Apply properties of operations as strategies to multiply and divide.

CCS applies to multiplication |
| | 1.2 Relate problem situations to number sentences involving addition and subtraction. | Operations and Algebraic Thinking | 2.OA.1: Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. | Yes | |
| | | Number and Operations in Base Ten | 2.NBT.7: Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship | | |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.		
	1.3 Solve addition and subtraction problems by using data from simple charts, picture graphs, and number sentences.	Number and Operations in Base Ten	2.NBT.7: Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	Yes	
Strand Measurement and Geometry	**CA Math Standard**				
1.0 Measurement and Geometry	1.0 Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured.	Measurement and Data	2.MD: Measure and estimate lengths in standard units. (Cluster Statement)	Yes	
	1.1 Measure the length of objects by iterating (repeating) a nonstandard or standard unit.	Measurement and Data	2.MD 1: Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks and measuring tapes.	Yes	CCS does not ask for nonstandard unit

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.2 Use different units to measure the same object and predict whether the measure will be greater or smaller when a different unit is used.	Measurement and Data	2.MD 2: Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	Yes	
	1.3 Measure the length of an object to the nearest inch and/or centimeter.	Measurement and Data	2.MD 9: Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.	Yes	
	1.4 Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year).	Measurement and Data	2.MD 7: Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	Partial	CCS does not ask for minutes in an hour, days in a month, weeks in a year.
	1.5 Determine the duration of intervals of time in hours (e.g., 11:00 a.m. to 4:00 p.m.).			No	3.MD.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
2.0 Measurement and Geometry	2.0 Students identify and describe the attributes of common figures in the plane and of common objects in space.	Geometry	2.G: Reason with shapes and their attributes. (Cluster Statement)	Yes	
	2.1 Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices.	Geometry	2.G 1: Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons and cubes.	Partial	CCS list of plane and solid shapes does not match CA.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	2.2 Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can be arranged to form a rectangle).			No	1.G.2: Compose two-dimensional shapes (rectangles, squares, trapezoids, triangle, half-circles, and quarter- circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composted shape.
Strand Statistics, Data Analysis and Probability	**CA Math Standard**				
1.0 Statistics, Data Analysis, and Probability	1.0 Students collect numerical data and record, organize, display, and interpret the data on bar graphs and other representations.	Measurement and Data	2.MD: Represent and interpret data. (Cluster Statement)	Yes	
	1.1 Record numerical data in systematic ways, keeping track of what has been counted.	Measurement and Data	2.MD 10: Draw a picture graph and bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	Yes	
	1.2 Represent the same data set in more than one way (e.g., bar graphs and charts with tallies).	Measurement and Data	2.MD 10: Draw a picture graph and bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	Yes	
	1.3 Identify features of data sets (range and mode).			No	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.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.4 Ask and answer simple questions related to data representations.	Measurement and Data	2.MD 10: Draw a picture graph and bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	Yes	
2.0 Statistics, Data Analysis, and Probability	2.0 Students demonstrate an understanding of patterns and how patterns grow and describe them in general ways.			No	3.OA: (Cluster Statement) Solve problems involving the four operations, and identify and explain patterns in arithmetic.
	2.1 Recognize, describe, and extend patterns and determine a next term in linear patterns (e.g., 4, 8, 12 . . . ; the number of ears on one horse, two horses, three horses, four horses).			No	3.OA.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
	2.2 Solve problems involving simple number patterns.			No	3.OA.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. CCS does not directly state "solve".
Strand Mathematical Reasoning	**CA Math Standard**				
1.0 Mathematical Reasoning	1.0 Students make decisions about how to set up a problem.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
	1.1 Determine the approach, materials, and strategies to be used.	Mathematical Practice Standards	MP5: Use appropriate tools strategically.	Yes	
	1.2 Use tools, such as manipulatives or sketches, to model problems.	Mathematical Practice Standards	MP4: Model with mathematics. MP5: Use appropriate tools strategically.	Yes	
2.0 Mathematical Reasoning	2.0 Students solve problems and justify their reasoning.	Mathematical Practice Standards	MP3: Construct viable arguments and critique the reasoning of others.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	2.1 Defend the reasoning used and justify the procedures selected.	Mathematical Practice Standards	MP3: Construct viable arguments and critique the reasoning of others.	Yes	
	2.2 Make precise calculations and check the validity of the results in the context of the problem.	Mathematical Practice Standards	MP6: Attend to precision.	Yes	
3.0 Mathematical Reasoning	3.0 Students note connections between one problem and another.	Mathematical Practice Standards	MP7: Look for and make use of structure. MP8: Look for and express regularity in repeated reasoning.	Yes	

Grade 2 Common Core Standards not found in Grade 2 CA Mathematics Standards

Domain	Common Core standard	Found in CA Math Standards
Operations and Algebraic Thinking	2 .OA.3: Determine whether a group of objects (up to 10) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	No
Measurement and Data	2.MD 3: Estimate lengths using units of inches, feet, centimeters and meters.	No
Measurement and Data	2.MD 4: Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	No
Measurement and Data	2.MD 5: Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for an unknown to represent the problem.	No
Measurement and Data	2.MD 6: Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, …, and represent whole-number sums and differences within 100 on a number line diagram.	No
Geometry	2.G.2: Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	No

Grade 2 CA Mathematics Standards not found in the Grade 2 Common Core Standards

Strand	CA Math Standard	Found in Common Core Standards
3.0 Number Sense	3.0 Students model and solve simple problems involving multiplication and division.	Yes. 2.OA: (Cluster Statement) Represent and solve problems involving multiplication and division.
3.0 Number Sense	3.2 Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division.	Yes. 3.OA.3: Use multiplication and division with 100 to solve word problem in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
3.0 Number Sense	3.3 Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory.	Yes. 3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one know 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
4.0 Number Sense	4.0 Students understand that fractions and decimals may refer to parts of a set and parts of a whole.	Yes. 3.NF: Develop an understanding of fractions as numbers. (Cluster Statement) CCS does not mention parts of sets, nor does it mention decimals.
4.0 Number Sense	4.1 Recognize, name, and compare unit fractions from ½ to 1/12.	Yes. 3.NF.1: Understand a fraction *1/b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by a parts of size *1/b*. 3.NF.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram. CCS does not name the specific fractions and uses the number line to identify.

Strand	CA Math Standard	Found in Common Core Standards
4.0 Number Sense	4.2 Recognize fractions of a whole and parts of a group (e.g., one-fourth of a pie, two-thirds of 15 balls).	Yes. 3.NF.1: Understand a fraction *1/b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by a parts of size *1/b*. CCS does not mention parts of groups.
Number Sense 5.0	5.2 Know and use the decimal notation and the dollar and cent symbols for money.	No. Decimal notation occurs in Grade 4 of the CCS, but not in relation to money.
Number Sense 6.0	6.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places.	No. CCS does not reference estimation directly. In the Mathematical Practice standards, CCS implies a thorough understanding of the concepts so students could develop strong estimation skills as a byproduct of the depth of understanding.
Number Sense 6.0	6.1 Recognize when an estimate is reasonable in measurements (e.g., closest inch).	No.
1.0 Algebra and Functions	1.0 Students model, represent, and interpret number relationships to create and solve problems involving addition and subtraction.	Yes. 3.OA: Represent and solve problems involving addition and subtraction. (Cluster Statement)
1.0 Algebra and Functions	1.1 Use the commutative and associative rules to simplify mental calculations and to check results.	Yes. 3.OA.5: Apply properties of operations as strategies to multiply and divide. CCS applies to multiplication
1.0 Measurement and Geometry	1.5 Determine the duration of intervals of time in hours (e.g., 11:00 a.m. to 4:00 p.m.).	Yes. 3.MD.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Strand	CA Math Standard	Found in Common Core Standards
2.0 Measurement and Geometry	2.2 Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can be arranged to form a rectangle).	Yes. 1.G.2: Compose two-dimensional shapes (rectangles, squares, trapezoids, triangle, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composted shape.
1.0 Statistics, Data Analysis, and Probability	1.3 Identify features of data sets (range and mode).	Yes. 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.
2.0 Statistics, Data Analysis, and Probability	2.0 Students demonstrate an understanding of patterns and how patterns grow and describe them in general ways.	Yes. 3.OA: (Cluster Statement) Solve problems involving the four operations, and identify and explain patterns in arithmetic.
	2.1 Recognize, describe, and extend patterns and determine a next term in linear patterns (e.g., 4, 8, 12 . . . ; the number of ears on one horse, two horses, three horses, four horses).	Yes. 3.OA.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
	2.2 Solve problems involving simple number patterns.	Yes. 3.OA.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. CCS does not directly state "solve".

Analysis of *California Mathematics* standards to *Common Core* standards-Grade 3

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
1.0 Number Sense	1.0 Students understand the place value of whole numbers.			No	CCS explains in the Grade 4 overview: "Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place." CCS does not mention what the place value limit in Grade 3.
	1.1 Count, read, and write whole numbers to 10,000.			No	4.NBT.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. CCS Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
	1.2 Compare and order whole numbers to 10,000.			No	4.NBT.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	1.3 Identify the place value for each digit in numbers to 10,000.			No	4.NBT.1: Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. CCS adds the comparison of one place value to the next (x 10).
	1.4 Round off numbers to 10,000 to the nearest ten, hundred, and thousand.	Numbers and Operations in Base Ten	3.NBT 1: Use place value understanding to round whole numbers to the nearest 10 or 100.	Partial	4.NBT.3: Use place value understanding to round multi-digit whole numbers to any place.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	1.5 Use expanded notation to represent numbers (e.g., 3,206 = 3,000 + 200 + 6).			No	
2.0 Number Sense	2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division:.	Operations and Algebraic Thinking	3.OAT (Cluster Statement)Use place value understanding and properties of operations to perform multi-digit arithmetic	Yes	
	2.1 Find the sum or difference of two whole numbers between 0 and 10,000.	Numbers and Operations in Base Ten	3.NBT.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	Yes	CCS does not set a place value limit for Grade 3. It is 1000 at Grade 2 and 1,000,000 at Grade 4.
	2.2 Memorize to automaticity the multiplication table for numbers between 1 and 10.	Operations and Algebraic Thinking	3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one know 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	Yes	
		Number and Operations in Base Ten	3.NBT.3: Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.	Yes	
	2.3 Use the inverse relationship of multiplication and division to compute and check results.	Operations and Algebraic Thinking	3.OA.4: Determine the unknown whole number in a multiplication or division equation relating three whole numbers3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one know 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
			3.OA.6: Understand division as an unknown-factor problem		
	2.4 Solve simple problems involving multiplication of multidigit numbers by one-digit numbers (3,671 x 3 = __).	Operations and Algebraic Thinking	3.OA.1: Interpret products of whole number, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each.	Yes	
			3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one know 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	Partial	CCS asks for fluency with numbers within 100.
	2.5 Solve division problems in which a multidigit number is evenly divided by a one-digit number (135 ÷ 5 = __).	Operations and Algebraic Thinking	3. OA.2: Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares or a number of groups can be expressed as 56 ÷ 8.	Yes	
			3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one know 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	Partial	CCS only designates within 100.
	2.6 Understand the special properties of 0 and 1 in multiplication and division.			No	
	2.7 Determine the unit cost when given the total cost and number of units.			No	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	2.8 Solve problems that require two or more of the skills mentioned above.	Operations and Algebraic Thinking	3.OA.3: Use multiplication and division with 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. 3.OA.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Yes	
3.0 Number Sense	3.0 Students understand the relationship between whole numbers, simple fractions, and decimals.	Number and Operations – Fractions	3.NF: (Cluster Statement) Develop an understanding of fractions as numbers.	Partial	CCS does not explicitly describe the relationship between whole numbers, simple fractions, and decimals. 4.NF: (Cluster Statement) Understand decimal notation for fractions, and compare decimal fractions.
	3.1 Compare fractions represented by drawings or concrete materials to show equivalency and to add and subtract simple fractions in context (e.g., 1/2 of a pizza is the same amount as 2/4 of another pizza that is the same size; show that 3/8 is larger than 1/4).	Number and Operations- Fractions	3.NF.3: Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. 3.NF.3a: Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. 3.NF.3b: Recognize and generate simple equivalent fractions, e.g., ½ = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
			3.NF.3c: Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. 3.NF.3d: Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual fraction model.		
	3.2 Add and subtract simple fractions (e.g., determine that 1/8 + 3/8 is the same as 1/2).	Number and Operations-Fractions	3.NF.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram. 3.NF.2a: Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. 3.NF.2b: Represent a fraction a/b on a number line diagram by marking off a length of 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.	Partial	CCS does not mention adding and subtracting of simple fractions. However, it is implied in statement 3.NF.2b.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	3.3 Solve problems involving addition, subtraction, multiplication, and division of money amounts in decimal notation and multiply and divide money amounts in decimal notation by using whole-number multipliers and divisors.			No	5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
	3.4 Know and understand that fractions and decimals are two different representations of the same concept (e.g., 50 cents is 1/2 of a dollar, 75 cents is 3/4 of a dollar).			No	4.NF.6: Use decimal notation for fractions with denominators 10 or 100. CCS describes the two different representations with denominators that are the powers of 10.
1.0 Algebra Functions	1.0 Students select appropriate symbols, operations, and properties to represent, describe, simplify, and solve simple number relationships.	Operations and Algebraic Thinking	3.OA: (Cluster Statement) Solve problems involving the four operations, and identify and explain patterns in arithmetic.	Yes	
	1.1 Represent relationships of quantities in the form of mathematical expressions, equations, or inequalities.		3.OA.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Yes	
	1.2 Solve problems involving numeric equations or inequalities.	Operations and Algebraic Thinking	3.OA.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	1.3 Select appropriate operational and relational symbols to make an expression true (e.g., if 4 __ 3 = 12, what operational symbol goes in the blank?).			No	
	1.4 Express simple unit conversions in symbolic form (e.g., __ inches = __ feet x 12).			No	5.MD.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5cm to 0.05m), and use these conversions in solving multi-step, real world problems.
	1.5 Recognize and use the commutative and associative properties of multiplication (e.g., if 5 x 7 = 35, then what is 7 x 5? and if 5 x 7 x 3 = 105, then what is 7 x 3 x 5?).	Operations and Algebraic Thinking	3.OA.5: Apply properties of operations as strategies to multiply and divide.	Yes	CCS adds the distributive property.
2.0 Algebra Functions	2.0 Students represent simple functional relationships:	Operations and Algebraic Thinking	3.OA: (Cluster Statement) Represent and solve problems involving multiplication and division.	Partial	
	2.1 Solve simple problems involving a functional relationship between two quantities (e.g., find the total cost of multiple items given the cost per unit).			No	
	2.2 Extend and recognize a linear pattern by its rules (e.g., the number of legs on a given number of horses may be calculated by counting by 4s or by multiplying the number of horses by 4).			No	4.OA.5: Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
1.0 Measurement and Geometry	1.0 Students choose and use appropriate units and measurement tools to quantify the properties of objects.	Measurement and Data	3.MD: Geometric measurement: understand concepts of area and relate area to multiplication and to addition. 3.MD: (Cluster Statements) Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	Partial	
	1.1 Choose the appropriate tools and units (metric and U.S.) and estimate and measure the length, liquid volume, and weight/mass of given objects.	Measurement and Data	3.MD.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	Partial	CCS does not mention length. It also does not mention U.S. measurement units. It also asks for the ability to utilize the four operations in solving problems dealing with volume and mass.
	1.2 Estimate or determine the area and volume of solid figures by covering them with squares or by counting the number of cubes that would fill them.	Measurement and Data	3.MD.5: Recognize area as an attribute of plane figures and understand concepts of area measurement. 3.MD.5a: A square with side length 1 unit, called a "unit square" is said to have "one square unit" of area, and can be used to measure area. 3.MD.5b: A plane figure which can be covered without gaps or overlaps by n unit squares is said to have and area of n square units.	Partial	5.MD.3: Recognize volume as an attribute of solid figures and understand concepts of volume measurement. 5.MD.3a: A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. 5.MD.3b: A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	1.3 Find the perimeter of a polygon with integer sides.	Measurement and Data	3.MD.8: Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	Yes	
	1.4 Carry out simple unit conversions within a system of measurement (e.g., centimeters and meters, hours and minutes).			No	5.MD.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5cm to 0.05m), and use these conversions in solving multi-step, real world problems.
2.0 Measurement and Geometry	2.0 Students describe and compare the attributes of plane and solid geometric figures and use their understanding to show relationships and solve problems.	Geometry	3.G: (Cluster Statement) Reason with shapes and their attributes.	Partial	
	2.1 Identify, describe, and classify polygons (including pentagons, hexagons, and octagons).			No	2.G.1: Reason and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons and cubes.
	2.2 Identify attributes of triangles (e.g., two equal sides for the isosceles triangle, three equal sides for the equilateral triangle, right angle for the right triangle).	Geometry	3.G 1: Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	Partial	CCS does not specifically mention triangles but uses the word "shapes".

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	2.3 Identify attributes of quadrilaterals (e.g., parallel sides for the parallelogram, right angles for the rectangle, equal sides and right angles for the square).	Geometry	3.G 1: Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	Yes	
	2.4 Identify right angles in geometric figures or in appropriate objects and determine whether other angles are greater or less than a right angle.			No	4.MD.5: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.

CCS states that students need to "understand concepts of angle measurement" and not specifically right angles. |
| | 2.5 Identify, describe, and classify common three-dimensional geometric objects (e.g., cube, rectangular solid, sphere, prism, pyramid, cone, cylinder). | | | No | 2.G.1: Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. |
| | 2.6 Identify common solid objects that are the components needed to make a more complex solid object. | | | No | 1.G.2: Compose two –dimensional shapes (rectangle, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cube, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
1.0 Statistics, Data Analysis, and Probability	1.0 Students conduct simple probability experiments by determining the number of possible outcomes and make simple predictions.			No	7.SP: (Cluster Statement) Use random sampling to draw inferences about a population.
	1.1 Identify whether common events are certain, likely, unlikely, or improbable.			No	7.SP.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
	1.2 Record the possible outcomes for a simple event (e.g., tossing a coin) and systematically keep track of the outcomes when the event is repeated many times.			No	7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
	1.3 Summarize and display the results of probability experiments in a clear and organized way (e.g., use a bar graph or a line plot).			No	7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. 7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible source of the discrepancy.
	1.4 Use the results of probability experiments to predict future events (e.g., use a line plot to predict the temperature forecast for the next day).			No	7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
					the probability. 7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible source of the discrepancy.
1.0 Mathematical Reasoning	1.0 Students make decisions about how to approach problems.				
	1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
	1.2 Determine when and how to break a problem into simpler parts.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
2.0 Mathematical Reasoning	2.0 Students use strategies, skills, and concepts in finding solutions.				
	2.1 Use estimation to verify the reasonableness of calculated results.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them	Yes	No estimation-They make conjectures about the form and meaning of the solution
	2.2 Apply strategies and results from simpler problems to more complex problems.				
	2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.	Mathematical Practice Standards	MP5: Use appropriate tools strategically.	Yes	
	2.4 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.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	2.5 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	Mathematical Practice Standards	MP6: Attend to precision.	Yes	
	2.6 Make precise calculations and check the validity of the results from the context of the problem.	Mathematical Practice Standards	MP6: Attend to precision.	Yes	
3.0 Mathematical Reasoning	3.0 Students move beyond a particular problem by generalizing to other situations.	Mathematical Practice Standards	MP7: Look for and make use of structure.	Yes	
	3.1 Evaluate the reasonableness of the solution in the context of the original situation.	Mathematical Practice Standards	MP8: Look for and express regularity in repeated reasoning.	Yes	
	3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.	Mathematical Practice Standards	MP7: Look for and make use of structure.	Yes	
	3.3 Develop generalizations of the results obtained and apply them in other circumstances.	Mathematical Practice Standards	MP7: Look for and make use of structure.	Yes	

Grade 3 Common Core Standards not found in Grade 3 CA Mathematics Standards

Domain	Common Core standard	Found in CA Math standards
Operations and Algebraic Thinking	3.OA 9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.	Partial Grade 2 SDAP 2.1
Measurement and Data	3.MD 1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving additions and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	No Grade 2 has time to the quarter hour and intervals of one hour. MG: 1.4 and 1.5
Measurement and Data	3.MD 4: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units-whole numbers, halves, or quarters.	No
Measurement and Data	3.MD 6: Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units.	Partial Grade 4 MG 1.1
Measurement and Data	3.MD 7: Relate area to the operations of multiplication and addition. A. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. B. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. C. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a x b and a x c. Use area models to represent the distributive property in mathematical reasoning. D. Recognize area as an additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	Partial Grade 5 MG 1.1
Geometry	3.G 2: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.	No

Grade 3 CA Mathematics Standards not found in the Grade 3 Common Core Standards

Strand	CA Math Standard	Found in CCS
Number Sense 1.0	1.0 Students understand the place value of whole numbers.	No-CCS explains in the Grade 4 overview: "Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place." CCS does not mention what the place value limit in Grade 3.
Number Sense 1.0	1.1 Count, read, and write whole numbers to 10,000.	Yes 4.NBT.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. CCS Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
Number Sense 1.0	1.2 Compare and order whole numbers to 10,000.	Yes. 4.NBT.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
Number Sense 1.0	1.3 Identify the place value for each digit in numbers to 10,000.	Yes. 4.NBT.1: Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. CCS adds the comparison of one place value to the next (x 10).
Number Sense 1.0	1.5 Use expanded notation to represent numbers (e.g., 3,206 = 3,000 + 200 + 6).	No
Number Sense 2.0	2.6 Understand the special properties of 0 and 1 in multiplication and division.	No
Number Sense 2.0	2.7 Determine the unit cost when given the total cost and number of units.	No
Number Sense 3.0	3.3 Solve problems involving addition, subtraction, multiplication, and division of money amounts in decimal notation and multiply and divide money amounts in decimal notation by using whole-number multipliers and divisors.	Yes 5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Strand	CA Math Standard	Found in CCS
Number Sense 3.0	3.4 Know and understand that fractions and decimals are two different representations of the same concept (e.g., 50 cents is 1/2 of a dollar, 75 cents is 3/4 of a dollar).	Yes 4.NF.6: Use decimal notation for fractions with denominators 10 or 100. CCS describes the two different representations with denominators that are the powers of 10.
Algebra Function 1.0	1.3 Select appropriate operational and relational symbols to make an expression true (e.g., if 4 __ 3 = 12, what operational symbol goes in the blank?).	No
Algebra Functions 1.0	1.4 Express simple unit conversions in symbolic form (e.g., __ inches = __ feet x 12).	Yes 5.MD.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5cm to 0.05m), and use these conversions in solving multi-step, real world problems.
Algebra Function 2.0	2.1 Solve simple problems involving a functional relationship between two quantities (e.g., find the total cost of multiple items given the cost per unit).	No
Algebra Functions 2.0	2.2 Extend and recognize a linear pattern by its rules (e.g., the number of legs on a given number of horses may be calculated by counting by 4s or by multiplying the number of horses by 4).	Yes 4.OA.5: Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
Measurement and Geometry 1.0	1.4 Carry out simple unit conversions within a system of measurement (e.g., centimeters and meters, hours and minutes).	Yes 5.MD.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5cm to 0.05m), and use these conversions in solving multi-step, real world problems.
Measurement and Geometry 2.0	2.1 Identify, describe, and classify polygons (including pentagons, hexagons, and octagons).	Yes 2.G.1: Reason and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons and cubes.
Measurement and Geometry 2.0	2.4 Identify right angles in geometric figures or in appropriate objects and determine whether other angles are greater or less than a right angle.	Yes 4.MD.5: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. CCS states that students need to "understand concepts of angle measurement" and not specifically right angles.

Strand	CA Math Standard	Found in CCS
Measurement and Geometry 2.0	2.5 Identify, describe, and classify common three-dimensional geometric objects (e.g., cube, rectangular solid, sphere, prism, pyramid, cone, cylinder).	2.G.1: Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
Measurement and Geometry 2.0	2.6 Identify common solid objects that are the components needed to make a more complex solid object.	Yes 1.G.2: Compose two –dimensional shapes (rectangle, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cube, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.
Statistics, Data Analysis, and Probability 1.0	1.0 Students conduct simple probability experiments by determining the number of possible outcomes and make simple predictions.	Yes 7.SP: (Cluster Statement) Use random sampling to draw inferences about a population.
Statistics, Data Analysis, and Probability 1.0	1.1 Identify whether common events are certain, likely, unlikely, or improbable.	Yes 7.SP.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
Statistics, Data Analysis, and Probability 1.0	1.2 Record the possible outcomes for a simple event (e.g., tossing a coin) and systematically keep track of the outcomes when the event is repeated many times.	Yes 7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
Statistics, Data Analysis, and Probability 1.0	1.3 Summarize and display the results of probability experiments in a clear and organized way (e.g., use a bar graph or a line plot).	Yes 7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. 7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible source of the discrepancy.
Statistics, Data Analysis, and Probability 1.0	1.4 Use the results of probability experiments to predict future events (e.g., use a line plot to predict the temperature forecast for the next day).	Yes 7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.

Strand	CA Math Standard	Found in CCS
		7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible source of the discrepancy.

Analysis of *California Mathematics* standards to *Common Core* standards
Grade 4

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
Strand Number Sense	**CA Math Standard**				
1.0 Number Sense	1.0 Students understand the place value of whole numbers and decimals to two decimal places and how whole numbers and decimals relate to simple fractions. Students use the concepts of negative numbers.	Number and Operations in Base Ten Number and Operations - Fractions	4.NBT: Generalize place value understanding for multi-digit whole numbers (Cluster Statement). 4.NF Cluster Statement: Understand decimal notation for fractions, and compare decimal fractions).	Yes	
	1.1 Read and write whole numbers in the millions.	Number and Operations in Base Ten	4.NBT.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meaning of the digits in each place, using >, =, and < symbols to record the results of comparisons.	Yes	CCS expectations for Grade 4 are limited to whole numbers less than or equal to 1,000,000.
	1.2 Order and compare whole numbers and decimals to two decimal places.	Number and Operations in Base Ten	4.NBT.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meaning of the digits in each place, using >, =, and < symbols to record the results of comparisons. 4.NF.7: Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual model.	Yes	
	1.3 Round whole numbers through the millions to the nearest ten, hundred, thousand, ten thousand, or hundred thousand.	Number and Operations in Base Ten	4.NBT.3: Use place value understanding to round multi-digit whole numbers to any place.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.4 Decide when a rounded solution is called for and explain why such a solution may be appropriate.	Operations and Algebraic Thinking	4.OA.3: Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Partial	
	1.5 Explain different interpretations of fractions, for , parts of a whole, parts of a set, and division of whole numbers by whole numbers; explain equivalents of fractions (see Standard 4.0).			No	CCS does not mention fractions as parts of a set. 3.NF1: Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$. 3.NF.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram. 3.NF.2a: Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. 3.NF.2b: Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					5.NF.3: Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem
	1.6 Write tenths and hundredths in decimal and fraction notations and know the fraction and decimal equivalents for halves and fourths (e.g., 1/2 = 0.5 or .50; 7/4 = 1 3/4 = 1.75).	Number and Operations – Fractions	4.NF.6: Use decimal notation for fractions with denominators 10 or 100.	Partial Grade 4	CCS does not specify other fractions than those with denominators of powers of 10. 3.NF.3: Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. 3.NF.3a: Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. 3.NF.3b: **Recognize and generate simple equivalent fractions, e.g., ½ = 2/4, 4/6 = 2/3. Explain whey the fractions are equivalent, e.g., by using a visual fraction model.** 3.NF.3c: Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. 3.NF.3d: Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
	1.7 Write the fraction represented by a drawing of parts of a figure; represent a given fraction by using drawings; and relate a fraction to a simple decimal on a number line.	Number and Operations – Fractions	4.NF.5: Express a fraction with denominator 10 as an equivalent fraction with a denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. Use decimal notation for fractions with denominators 10 or 100. 4.NF.7: Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual model.	Partial	CCS does not ask students to draw a fraction.

CCS does not specify other fractions than those with denominators of powers of 10. |
| | 1.8 Use concepts of negative numbers (e.g., on a number line, in counting, in temperature, in "owing"). | | | No | CCS states two numbers on a number line not explicitly two negative numbers.

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

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

6.NS.b7: **Write, interpret, and explain statements of order for rational numbers in real-world contexts.**

6.NS.7c: Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					magnitude for a positive or negative quantity in a real-world situation. 6.NS.7d: Distinguish comparisons of absolute value from statements about order.
	1.9 Identify on a number line the relative position of positive fractions, positive mixed numbers, and positive decimals to two decimal places.	Number and Operations – Fractions	4.NF.7: Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual model.	Partial	3.NF.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram. 3.NF.2a: Represent a fraction *1/b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size *1/b* and that the endpoint of the part based at 0 locates the number *1/b* on the number line. 3.NF.2b: Represent a fraction *a/b* on a number line diagram by marking off a lengths *1/b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.
2.0 Number Sense	2.0 Students extend their use and understanding of whole numbers to the addition and subtraction of simple decimals.			No	5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
	2.1 Estimate and compute the sum or difference of whole numbers and positive decimals to two places.			No	5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value,

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					properties of operations, and/or relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. CCS does not reference estimation directly. In the Mathematical Practice standards, CCS implies a thorough understanding of the concepts so students could develop strong estimation skills as a byproduct of the depth of understanding.
	2.2 Round two-place decimals to one decimal or the nearest whole number and judge the reasonableness of the rounded answer.			No	5.NBT.4: Use place value understanding to round decimals to any place.
3.0 Number Sense	3.0 Students solve problems involving addition, subtraction, multiplication, and division of whole numbers and understand the relationships among the operations.	Number and Operations in Base 10	4.NBT: (Cluster Statement) Use place value understanding and properties of operations to perform multi-digit arithmetic	Yes	
	3.1 Demonstrate an understanding of, and the ability to use, standard algorithms for the addition and subtraction of multi digit numbers.	Number and Operations in Base 10	4.NBT.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Yes	
	3.2 Demonstrate an understanding of, and the ability to use, standard algorithms for multiplying a multi digit number by a two-digit number and for dividing a multi digit number by a one-digit number; use relationships between them to simplify computations and to check results.	Number and Operations in Base 10	4.NBT.5: Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.NBT.6: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and	Partial	5.NBT.5: Fluently multiply multi-digit whole numbers using the standard algorithm.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.		
	3.3 Solve problems involving multiplication of multi digit numbers by two-digit numbers.	Number and Operations in Base 10	4.NBT.5: Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Partial	5.NBT.5: Fluently multiply multi-digit whole numbers using the standard algorithm.
	3.4 Solve problems involving division of multi digit numbers by one-digit numbers.	Number and Operations in Base Ten	4.NBT.6: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Partial	6.NS.2: Fluently divide multi-digit numbers using the standard algorithm.
4.0 Number Sense	4.0 Students know how to factor small whole numbers.	Operations and Algebraic Thinking	4.OA: (Cluster Statement) Gain familiarity with factors and multiples.	Yes	
	4.1 Understand that many whole numbers break down in different ways (e.g., 12 = 4 x 3 = 2 x 6 = 2 x 2 x 3).	Operations and Algebraic Thinking	4.OA.4: Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	Partial	CCS only mentions factor pairs.
	4.2 Know that numbers such as 2, 3, 5, 7, and 11 do not have any factors except 1 and themselves and that such numbers are called prime numbers.	Operations and Algebraic Thinking	4.OA.4: Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			whole number in the range 1-100 is prime or composite.		
1.0 Algebra and Functions	1.0 Students use and interpret variables, mathematical symbols, and properties to write and simplify expressions and sentences.		4.0A.2: Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.[1]	Yes	
	1.1 Use letters, boxes, or other symbols to stand for any number in simple expressions or equations (e.g., demonstrate an understanding and the use of the concept of a variable).	Operations and Algebraic Thinking	4.OA.3: Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Partial	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.
	1.2 Interpret and evaluate mathematical expressions that now use parentheses.			No	5.OA.1 Use parentheses brackets, or braces in numerical expressions, and evaluate these expressions with these symbols.
	1.3 Use parentheses to indicate which operation to perform first when writing expressions containing more than two terms and different operations.			No	5.OA.1 Use parentheses brackets, or braces in numerical expressions, and evaluate these expressions with these symbols.
	1.4 Use and interpret formulas (e.g., area = length x width or $A = lw$) to answer questions about quantities and their relationships.	Measurement and Data	4.MD.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problem.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.5 Understand that an equation such as $y = 3x + 5$ is a prescription for determining a second number when a first number is given.			No	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.
2.0 Algebra and Functions	2.0 Students know how to manipulate equations.			No	6.EE Cluster Statement -Reason about and solve one-variable equations and inequalities.
	2.1 Know and understand that equals added to equals are equal.			No	CCS see glossary Table 4.
	2.2 Know and understand that equals multiplied by equals are equal.			No	CCS see glossary Table 4.
Strand Measurement and Geometry	**CA Math Standard**				
1.0 Measurement and Geometry	1.0 Students understand perimeter and area.	Measurement and Data	4.MD: (Cluster Statement) Solve problems involving measurement and conversion of measurements from a lager unit to a smaller unit.	Yes	
	1.1 Measure the area of rectangular shapes by using appropriate units, such as square centimeter (cm^2), square meter (m^2), square kilometer (km^2), square inch (in^2), square yard (yd^2), or square mile (mi^2).	Measurement and Data	4.MD.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problem.	Yes	
	1.2 Recognize that rectangles that have the same area can have different perimeters.	Measurement and Data	4.MD.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problems	Partial	CCS does not explicitly describe the area/perimeter relationship.
	1.3 Understand that rectangles that have the same perimeter can have different areas.	Measurement and Data	4.MD.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problems	Partial	CCS does not explicitly describe the area/perimeter relationship.
	1.4 Understand and use formulas to solve problems involving perimeters and areas of rectangles and squares. Use those formulas to find the areas of more	Measurement and Data	4.MD.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problems	Partial	6.G.1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	complex figures by dividing the figures into basic shapes.				decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
2.0 Measurement and Geometry	2.0 Students use two-dimensional coordinate grids to represent points and graph lines and simple figures.			No	5.G: Graph points on the coordinate plane to solve real-world and mathematical problems (Cluster Statement).
	2.1 Draw the points corresponding to linear relationships on graph paper (e.g., draw 10 points on the graph of the equation $y = 3x$ and connect them by using a straight line).			No	5.G.2: Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation. 5.OA.3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane..
	2.2 Understand that the length of a horizontal line segment equals the difference of the x- coordinates.			No	See Introduction: Grade 8 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 $m·A$.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	2.3 Understand that the length of a vertical line segment equals the difference of the *y*- coordinates.			No	See Introduction: Grade 8 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 $m \cdot A$.
3.0 Measurement and Geometry	3.0 Students demonstrate an understanding of plane and solid geometric objects and use this knowledge to show relationships and solve problems.	Geometry	4.G: (Cluster Statement) Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	Yes	
	3.1 Identify lines that are parallel and perpendicular.	Geometry	4.G.1: Draw points, lines, line segments, rays, angle (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2: Classify two-dimensional figures based on the presence of absence of parallel or perpendicular line, or the presence or absence of angle of a specified size. Recognize right triangles as a category, and identify right triangles. | Yes | |
| | 3.2 Identify the radius and diameter of a circle. | | | No | 7.G.4: Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					CCS does not explicitly identify radius and diameter.
	3.3 Identify congruent figures.			No	8.G.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.
	3.4 Identify figures that have bilateral and rotational symmetry.	Geometry	4.G.3: Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	Yes	
	3.5 Know the definitions of a right angle, an acute angle, and an obtuse angle. Understand that 90°, 180°, 270°, and 360° are associated, respectively, with 1/4, 1/2, 3/4, and full turns.	Geometry	4.G.2: Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. 4.MD.5: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. **4.MD.5.a: An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.**	Partial	CCS does not specify knowing definitions of types of angles.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			4.MD.5.b: An angle that turns through n one-degree angles is said to have an angle measure of n degrees.		
	3.6 Visualize, describe, and make models of geometric solids (e.g., prisms, pyramids) in terms of the number and shape of faces, edges, and vertices; interpret two-dimensional representations of three-dimensional objects; and draw patterns (of faces) for a solid that, when cut and folded, will make a model of the solid.			No	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.
	3.7 Know the definitions of different triangles (e.g., equilateral, isosceles, scalene) and identify their attributes.	Geometry	4.G.2: Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence of absence of angle of a specified size. Recognize right triangle as a category, and identify right triangles.	Partial	CCS classifies two-dimensional figures. Recognizes right triangles as a category. Does not specifically use triangle names.
	3.8 Know the definition of different quadrilaterals (e.g., rhombus, square, rectangle, parallelogram, trapezoid).	Geometry	4.G.2: Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence of absence of angle of a specified size. Recognize right triangle as a category, and identify right triangles.	Partial	CCS classifies two-dimensional figures. Recognizes right triangles as a category. Does not specifically use quadrilateral names.
Strand Statistics, Data Analysis, and Probability	**CA Math Standard**				
1.0 Statistics, Data Analysis, and Probability	1.0 Students organize, represent, and interpret numerical and categorical data and clearly communicate their findings.	Measurement and Data	4.MD: (Cluster Statement) Represent and interpret data.	Yes	
	1.1 Formulate survey questions; systematically collect and represent data on a number line; and coordinate graphs, tables, and charts.			No	6.SP.1: Recognize a statistical question as one that anticipates variability in the data related to the questions and account for it in the answers.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.2 Identify the mode(s) for sets of categorical data and the mode(s), median, and any apparent outliers for numerical data sets.			No	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.
	1.3 Interpret one-and two-variable data graphs to answer questions about a situation.	Measurement and Data	4.MD.4: Make a line plot to display a data set of measurements in fractions of a unit (1/2, ¼, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.	Yes	
2.0 Statistics, Data Analysis, and Probability	2.0 Students make predictions for simple probability situations.			No	7.SP Cluster Statement: Investigate chance processes and develop use, and evaluate probability models.
	2.1 Represent all possible outcomes for a simple probability situation in an organized way (e.g., tables, grids, tree diagrams).			No	7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
	2.2 Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4; 3 /4).			No	7.SP.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. 7.SP.8a: **Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.**

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. 7.SP.8c: Design and use a simulation to generate frequencies for compound events
Strand Mathematical Reasoning	**CA Math Standard**				
1.0 Mathematical Reasoning	1.0 Students make decisions about how to approach problems.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
	1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
	1.2 Determine when and how to break a problem into simpler parts.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
2.0 Mathematical Reasoning	2.0 Students use strategies, skills, and concepts in finding solutions.	Mathematical Practice Standards	MP3: Construct viable arguments and critique the reasoning of others,	Yes	
	2.1 Use estimation to verify the reasonableness of calculated results.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
	2.2 Apply strategies and results from simpler problems to more complex problems.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
	2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	2.4 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.	Mathematical Practice Standards	MP6: Attend to precision.	Yes	
	2.5 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	Mathematical Practice Standards	MP1: Make sense of problems and persevere in solving them.	Yes	
	2.6 Make precise calculations and check the validity of the results from the context of the problem.	Mathematical Practice Standards	MP7: Look for and make use of structure.	Yes	
3.0 Mathematical Reasoning	3.0 Students move beyond a particular problem by generalizing to other situations.	Mathematical Practice Standards	MP8: Look for and express regularity in repeated reasoning.	Yes	
	3.1 Evaluate the reasonableness of the solution in the context of the original situation.	Mathematical Practice Standards	MP7: Look for and make use of structure.	Yes	
	3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.	Mathematical Practice Standards	MP7: Look for and make use of structure.	Yes	
	3.3 Develop generalizations of the results obtained and apply them in other circumstances.	Mathematical Practice Standards	MP7: Look for and make use of structure.	Yes	

Grade 4 Common Core Standards not found in Grade 4 CA Mathematics Standards

Domain	Common Core standard	Found in CA Math standards
Operations and Algebraic Thinking	4.OA.1: Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	No
Operations and Algebraic Thinking	4.OA.5: Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For , given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*	Partial Grade 7 AF1.1
Number and Operations in Base Ten	4.NBT.1: Recognize that in a multi-digit whole number a digit in one place represents ten times what it represents in the place to its right. *For , recognize that 700/70 = 10 by applying concepts of place value and division.*	No
Number and Operations – Fractions	4.NF.1: Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	Partial Grade 5 NS1.2
Number and Operations – Fractions	4.NF.2: Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols, =, or >, and justify the conclusions, e.g., by using a visual fraction model.	Partial Grade 5 NS2.3
Number and Operations – Fractions	4.NF.3: Understand a fraction *a/b* with *a > 1* as a sum of fractions *1/b*.	No
Number and Operations – Fractions	4.NF.3a: Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	No
Number and Operations – Fractions	4.NF.3b: Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *s: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*	No
Number and Operations – Fractions	4.NF.3c: Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	Yes Grade 5 NS2.3
Number and Operations – Fractions	4.NF.3d: Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Yes Grade 5 NS2.3
Number and Operations – Fractions	4.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	Yes Grade 5 NS 2.4

Domain	Common Core standard	Found in CA Math standards
Number and Operations – Fractions	4.NF.4a: Understand a fraction *a/b* as a multiple of *1/b*	No
Number and Operations – Fractions	4.NF.4b: Understand a multiple of *a/b* as a multiple of *1/b* and use this understanding to multiply a fraction by a whole number.	No
Number and Operations – Fractions	4.NF.4c: Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.	Yes Grade 5 NS 2.5
Measurement and Data	4.MD.1: Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; l, ml, hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.	Partial Grade 6 MG2.1 Grade 7 MG1.1
Measurement and Data	4.MD.2: Use the four operations to solve word problems involving distance, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problem that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	Yes Grade 5 MG 1.4
Measurement and Data	4.MD.5b: An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	No
Measurement and Data	4.MD.6: Measure angles in whole-number degrees using a protractor. Sketch angle of specified measure.	Yes Grade 5 MG 2.1
Measurement and Data	4.MD.7: Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	No

Grade 4 CA Mathematics Standards not found in Grade 4 Common Core Standards

Strand	CA Math Standard	Found in Common Core Standards
1.0 Number Sense	1.5 Explain different interpretations of fractions, for, parts of a whole, parts of a set, and division of whole numbers by whole numbers; explain equivalents of fractions (see Standard 4.0).	Yes. 3.NF1: Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$. 3.NF.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram. 3.NF.2a: Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. 3.NF.2b: Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. 5.NF.3: Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem CCS does not mention fractions as parts of a set.

Strand	CA Math Standard	Found in Common Core Standards
1.0 Number Sense	1.8 Use concepts of negative numbers (e.g., on a number line, in counting, in temperature, in "owing").	Yes. 6.NS.7: Understand ordering and absolute value of rational numbers. 6.NS.a7: **Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.** 6.NS.7b: **Write, interpret, and explain statements of order for rational numbers in real-world contexts. For , write –3 oC > –7 oC to express the fact that –3 oC is warmer than –7 oC.** 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. 6.NS.7d: Distinguish comparisons of absolute value from statements about order. CCS states two numbers on a number line not explicitly two negative numbers.
2.0 Number Sense	2.0 Students extend their use and understanding of whole numbers to the addition and subtraction of simple decimals.	Yes. 5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
2.0 Number Sense	2.1 Estimate and compute the sum or difference of whole numbers and positive decimals to two places.	Yes. 5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. CCS does not reference estimation directly. In the Mathematical Practice standards, CCS implies a thorough understanding of the concepts so students could develop strong estimation skills as a byproduct of the depth of understanding.

Strand	CA Math Standard	Found in Common Core Standards
2.0 Number Sense	2.2 Round two-place decimals to one decimal or the nearest whole number and judge the reasonableness of the rounded answer.	Yes. 5.NBT.4: Use place value understanding to round decimals to any place.
1.0 Algebra and Functions	1.2 Interpret and evaluate mathematical expressions that now use parentheses.	Yes. 5.OA.1: Use parentheses brackets, or braces in numerical expressions, and evaluate these expressions with these symbols.
1.0 Algebra and Functions	1.3 Use parentheses to indicate which operation to perform first when writing expressions containing more than two terms and different operations.	Yes. 5.OA.1: Use parentheses brackets, or braces in numerical expressions, and evaluate these expressions with these symbols.
1.0 Algebra and Functions	1.5 Understand that an equation such as $y = 3x + 5$ is a prescription for determining a second number when a first number is given.	Yes. 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.
2.0 Algebra and Functions	2.0 Students know how to manipulate equations.	Yes. 6.EE: Reason about and solve one-variable equations and inequalities. (Cluster Statement Grade 6)
2.0 Algebra and Functions	2.1 Know and understand that equals added to equals are equal.	No. CCS see glossary Table 4.
2.0 Algebra and Functions	2.2 Know and understand that equals multiplied by equals are equal.	No. CCS see glossary Table 4.
2.0 Measurement and Geometry	2.0 Students use two-dimensional coordinate grids to represent points and graph lines and simple figures.	Yes. 5.G: Graph points on the coordinate plane to solve real-world and mathematical problems (Cluster Statement).
2.0 Measurement and Geometry 2.0	2.1 Draw the points corresponding to linear relationships on graph paper (e.g., draw 10 points on the graph of the equation y = 3 x and connect them by using a straight line).	Yes. 5.G.2: Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation. 5.OA.3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

Strand	CA Math Standard	Found in Common Core Standards
Measurement and Geometry 2.0	2.2 Understand that the length of a horizontal line segment equals the difference of the x- coordinates.	Yes. See Introduction: Grade 8 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.
Measurement and Geometry 2.0	2.3 Understand that the length of a vertical line segment equals the difference of the y- coordinates.	Yes. See Introduction: Grade 8 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.
Measurement and Geometry 3.0	3.2 Identify the radius and diameter of a circle.	Yes. 7.G.4: Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. CCS does not explicitly identify radius and diameter.
Measurement and Geometry 3.0	3.3 Identify congruent figures.	Yes. 8.G.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.

Strand	CA Math Standard	Found in Common Core Standards
Measurement and Geometry 3.0	3.6 Visualize, describe, and make models of geometric solids (e.g., prisms, pyramids) in terms of the number and shape of faces, edges, and vertices; interpret two-dimensional representations of three-dimensional objects; and draw patterns (of faces) for a solid that, when cut and folded, will make a model of the solid.	Yes. 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.
Statistics, Data Analysis, and Probability 1.0	1.1 Formulate survey questions; systematically collect and represent data on a number line; and coordinate graphs, tables, and charts.	Yes. 6.SP.1: Recognize a statistical question as one that anticipates variability in the data related to the questions and account for it in the answers.
Statistics, Data Analysis, and Probability 1.0	1.2 Identify the mode(s) for sets of categorical data and the mode(s), median, and any apparent outliers for numerical data sets.	Yes. 6.SP.1: Recognize a statistical question as one that anticipates variability in the data related to the questions and account for it in the answers.
Statistics, Data Analysis, and Probability 2.0	2.0 Students make predictions for simple probability situations.	Yes. 7.SP: (Cluster Statement) Investigate chance processes and develop use, and evaluate probability models.
Statistics, Data Analysis, and Probability 2.0	2.1 Represent all possible outcomes for a simple probability situation in an organized way (e.g., tables, grids, tree diagrams).	Yes. 7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
Statistics, Data Analysis, and Probability 2.0	2.2 Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4; 3 /4).	Yes. 7.SP.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. 7.SP.8a: **Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.** 7.S7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. 7.S7.SP.8c: Design and use a simulation to generate frequencies for compound events

Analysis of *California Mathematics* standards to *Common Core* standards-Grade 5

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
Strand Number Sense	**CA Math Standard**				
1.0 Number Sense	1.0 Students compute with very large and very small numbers, positive integers, decimals, and fractions and understand the relationship between decimals, fractions, and percents. They understand the relative magnitudes of numbers.	Number Operations in Base Ten	5.NBT: (Cluster Statement) Perform operations with multi-digit whole numbers and with decimals to hundredths.	Partial	CCS Cluster Statement does not mention integers and percents.
	1.1 Estimate, round, and manipulate very large (e.g., millions) and very small (e.g., thousandths) numbers.	Number Operations in Base Ten	5.NBT.1: Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. 5.NBT.3: Read, write, and compare decimals to thousandths. **5.NBT.3a: Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (1/1000).** 5.NBT.3b: Compare two decimals to thousandths based on meaning of the digits in each place, using >, =, and < symbols to record the results of comparisons. 5.NBT.4: Use place value understanding to round decimals to any place.	Partial	CCS does not reference estimation directly. In the Mathematical Practice standards, CCS implies a thorough understanding of the concepts so students could develop strong estimation skills as a by-product of the depth of understanding. 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.
	1.2 Interpret percents as a part of a hundred; find decimal and percent equivalents for common fractions and explain why they represent the same value; compute a given percent of a			No	6.RP.3a: Make table of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	whole number.				plane. Use table 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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
	1.3 Understand and compute positive integer powers of nonnegative integers; compute examples as repeated multiplication.			No	6.EE.1: Write and evaluate numerical expressions involving whole-number exponents.
	1.4 Determine the prime factors of all numbers through 50 and write the numbers as the product of their prime factors by using exponents to show multiples of a factor (e.g., 24 = 2 x 2 x 2 x 3 = 2^3 x 3).			No	4.OA.4: Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range is prime or composite.
	1.5 Identify and represent on a number line decimals, fractions, mixed numbers, and positive and negative integers.			No	6.NS.6: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					familiar from previous grades to represent points on the line and in the plane with negative number coordinates. 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 then 0 is its own opposite. 6.NS.6b: Write interpret, and explain statements of order for rational number in real-world contexts. **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 the coordinate plane.**
2.0 Number Sense	2.0 Students perform calculations and solve problems involving addition, subtraction, and simple multiplication and division of fractions and decimals.	Number and Operations – Fractions Number and Operations Base Ten	5.NF: (Cluster Statement) Use equivalent fractions as a strategy to add and subtract fractions. Apply and extend previous understanding of multiplication and division to multiply and divide fractions. 5.NBT: (Cluster Statement) Perform Operations with multi-digit whole numbers and with decimals to hundredths.	Yes	

Analysis by Sacramento County Office of Education
June 22, 2010 - **Addendum A**

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Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	2.1 Add, subtract, multiply, and divide with decimals; add with negative integers; subtract positive integers from negative integers; and verify the reasonableness of the results.	Number and Operations in Base Ten	5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; related the strategy to a written method and explain the reasoning used.	Partial	6.NS.3: Fluently add, subtract, multiply and divide multi-digit decimals using the standard algorithm for each operation.

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 number line diagram. |
| | 2.2 Demonstrate proficiency with division, including division with positive decimals and long division with multidigit divisors. | Number Operations in Base Ten | 5.NBT.6: Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

5.NBT.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. | Yes | |
| | 2.3 Solve simple problems, including ones arising in concrete situations, involving the addition and subtraction of fractions and mixed numbers (like and unlike denominators of 20 or less), and express answers in the simplest form. | Number and Operations - Fractions | 5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. | Yes | |
| | 2.4 Understand the concept of multiplication and division of fractions. | Number and Operations - Fractions | 5.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

5.NF.4a: Interpret the product (a/b) × q as a parts of a | Yes | *Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.) 5.NF.4b: Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. 5.NF.6: Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. 5.NF.7: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions*.		multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.
	2.5 Compute and perform simple multiplication and division of fractions and apply these procedures to solving problems.	Number and Operations - Fractions	5.NF.6: Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. 5.NF.7: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. 5.NF.7a: Interpret division of a unit fraction by a non-zero whole number and compute such quotients. For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			5.NF.7b: Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4. **5.NF.7c: Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.**		
Strand Algebra Functions	**CA Math Standard**				
1.0 Algebra Functions	1.0 Students use variables in simple expressions, compute the value of the expression for specific values of the variable, and plot and interpret the results.	Operations and Algebraic Thinking	5.OA: Write and interpret numerical expressions.	Partial	6.EE: (Cluster Statement) Apply and extend previous understandings of arithmetic to algebraic expressions.
	1.1 Use information taken from a graph or equation to answer questions about a problem situation.			No	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 table, and relate these to the equation.
	1.2 Use a letter to represent an unknown number; write and evaluate simple algebraic expressions in one variable by substitution.			No	6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.3 Know and use the distributive property in equations and expressions with variables.			No	6.EE.3: Apply the properties of operations to generate equivalent expressions.
	1.4 Identify and graph ordered pairs in the four quadrants of the coordinate plane.	Geometry	5.G.1: Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plan located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	Partial	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.
	1.5 Solve problems involving linear functions with integer values; write the equation; and graph the resulting ordered pairs of integers on a grid.	Geometry Grade 5	5.G.2: Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation. 5.OA.3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.	Partial	6.EE.9: Use variable 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 variable using graphs and table and relate these to the equation.
Strand Measurement and Geometry	**CA Math Standard**				
1.0 Measurement and Geometry	1.0 Students understand and compute the volumes and areas of simple objects.	Measurement and Data	5.MD: (Cluster Statement) Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.1 Derive and use the formula for the area of a triangle and of a parallelogram by comparing it with the formula for the area of a rectangle (i.e., two of the same triangles make a parallelogram with twice the area; a parallelogram is compared with a rectangle of the same area by cutting and pasting a right triangle on the parallelogram).			No	6.G.1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangle or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
	1.2 Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area for these objects.			No	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.
	1.3 Understand the concept of volume and use the appropriate units in common measuring systems (i.e., cubic centimeter [cm^3], cubic meter [m^3], cubic inch [in^3], cubic yard [yd^3]) to compute the volume of rectangular solids.	Measurement and Data	5.MD.3: Recognize volume as an attribute of solid figures and understand concepts of volume measurement. 5.MD.3a: A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. 5.MD.3b: A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. 5.MD.4: Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			5.MD.5: Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. **5.MD.5a: Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edges lengths, equivalently by multiplying the heights by the area of the base. Represent threefold whole-number products as volumes e.g., to represent the associative property of multiplication.** **5.MD.5b: Apply the formulas V = l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular with whole number edge lengths in the context of solving real world and mathematical problems.** 5.MD.5c: Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.		
	1.4 Differentiate between, and use appropriate units of measures for, two-and three-dimensional objects (i.e., find the perimeter, area, volume).	Measurement and Data	5.MD.4: Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	Partial	4.MD.2: Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					4.MD.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problems. CCS does not mention differentiate between appropriate units of measure.
2.0 Measurement and Geometry	2.0 Students identify, describe, and classify the properties of, and the relationships between, plane and solid geometric figures.	Geometry	5.G: (Cluster Statement) Classify two-dimensional figures into categories based on their properties. 5.G.3: Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. 5.G.4: Classify two-dimensional figures in a hierarchy based on properties.	Yes	
	2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).	Measurement and Data	4.MD.5: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: **4.MD.5a: An angle is measure with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle" and can be used to measure angles.** 4.MD.5b: An angle that turns through n one-degree angles is said to have an angle measure of n degrees. 4.MD.6: Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. 4.MD.1: Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	Partial	7.G: (Cluster Statement) Draw, construct and describe geometrical figures and describe the relationships between them.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	2.2 Know that the sum of the angles of any triangle is 180° and the sum of the angles of any quadrilateral is 360° and use this information to solve problems.			No	8.G.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.
	2.3 Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids.			No	7.G.3: Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. CCS does not specify drawing two-dimensional views of three-dimensional objects.
Strand Statistics, Data Analysis, and Probability	**CA Math Standard**				
1.0 Statistics, Data Analysis, and Probability	1.0 Students display, analyze, compare, and interpret different data sets, including data sets of different sizes.	Measurement and Data	5.MD: (Cluster Statement) Represent and interpret data.	Yes	
	1.1 Know the concepts of mean, median, and mode; compute and compare simple examples to show that they may differ.			No	6.SP.5: Summarize numerical data sets in relation to their context, such as by: 6.SP.5a: Reporting the number of observations. 6.SP.5b: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					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.
	1.2 Organize and display single-variable data in appropriate graphs and representations (e.g., histogram, circle graphs) and explain which types of graphs are appropriate for various data sets.			No	6.SP.4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots. CCS does not mention circle graph.
	1.3 Use fractions and percentages to compare data sets of different sizes.	Measurement and Data	5.MD.2: Make a line plot to display a data set of measurements in fractions of a unit (1/2, ¼, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.	Partial	CCS does not specify using percentages to compare data.
	1.4 Identify ordered pairs of data from a graph and interpret the meaning of the data in terms of the situation depicted by the graph.			No	7.RP.2: Recognize and represent proportional relationships between quantities. 7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
					is a straight line through the origin. 7.RP.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 7.RP.2c: Represent proportional relationships by equations. **7.RP.2d: Explain that a point (x,y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0,0) and (1,r) where r is the unit rate.**
	1.5 Know how to write ordered pairs correctly; for example, (*x, y*).	Geometry	5.G.1: Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plan located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	Yes	
Strand Mathematical Reasoning	**CA Math Standard**				
1.0 Mathematical Reasoning	1.0 Students make decisions about how to approach problems:	Mathematical Practice Standards	5.MP1: Make sense of problems and persevere in solving them.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.	Mathematical Practice Standards	5.MP1: Make sense of problems and persevere in solving them.	Yes	
	1.2 Determine when and how to break a problem into simpler parts.	Mathematical Practice Standards	5.MP1: Make sense of problems and persevere in solving them.	Yes	
2.0 Mathematical Reasoning	2.0 Students use strategies, skills, and concepts in finding solutions.	Mathematical Practice Standards	5.MP3: Construct viable arguments and critique the reasoning of others.	Yes	
	2.1 Use estimation to verify the reasonableness of calculated results.	Mathematical Practice Standards	5.MP1: Make sense of problems and persevere in solving them.	Yes	CCS does not reference estimation directly. In the Mathematical Practice standards, CCS implies a thorough understanding of the concepts so students could develop strong estimation skills as a byproduct of the depth of understanding.
	2.2 Apply strategies and results from simpler problems to more complex problems.	Mathematical Practice Standards	5.MP1: Make sense of problems and persevere in solving them.	Yes	
	2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.	Mathematical Practice Standards	5.MP1: Make sense of problems and persevere in solving them.	Yes	
	2.4 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.	Mathematical Practice Standards	5.MP1: Make sense of problems and persevere in solving them.		

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	2.5 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	Mathematical Practice Standards	5.MP6: Attend to precision.		
	2.6 Make precise calculations and check the validity of the results from the context of the problem.	Mathematical Practice Standards	5.MP1: Make sense of problems and persevere in solving them.		
3.0 Mathematical Reasoning	3.0 Students move beyond a particular problem by generalizing to other situations.	Mathematical Practice Standards	5.MP7: Look for and make use of structure.		
	3.1 Evaluate the reasonableness of the solution in the context of the original situation.	Mathematical Practice Standards	5.MP8: Look for and express regularity in repeated reasoning.		
	3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.	Mathematical Practice Standards	5.MP7: Look for and make use of structure.		
	3.3 Develop generalizations of the results obtained and apply them in other circumstances.	Mathematical Practice Standards	5.MP7: Look for and make use of structure.		

Grade 5 Common Core Standards not found in Grade 5 CA Mathematics Standards

Domain	Common Core Standard	Found in CA Math Standards
Operations and Algebraic Thinking	5.OA.1: Use parentheses brackets, or braces in numerical expressions, and evaluate these expressions with these symbols.	Yes Grade 4 AF1.2
Operations and Algebraic Thinking	5.OA.2: Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.	Yes Grade 7 AF1.1
Number and Operations in Base Ten	5.NBT.2: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	Partial Grade 7 NS1.1
Number and Operations in Base Ten	5.NBT.5: Fluently multiply multi-digit whole numbers using the standard algorithm.	Partial Grade 4 NS3.2
Number and Operations - Fractions	5.NF.2: Solve word problems involving addition and subtraction of fractions referring to the same who, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.	No
Number and Operations – Fractions	5.NF.3: Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	Yes Grade 4 NS1.5
Number and Operations – Fractions	5.NF.4a: Interpret the product (a/b) x q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x q $\div b$.	Yes Grade 6 NS2.2
Number and Operations – Fractions	5.NF.4b: Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriated unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	Partial Grade 4 MG1.1
Number and Operations – Fractions	5.NF.5: Interpret multiplications as scaling (resizing) by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater that the given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \ x \ a)/ (n \ x \ b)$ to the effect multiplying a/b by 1.	Partial Grade 6 NS1.3 Partial Grade 7 MG1.2
Number and Operations – Fractions	5.NF.7a: Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.	Yes Grade 6 NS2.2

Domain	Common Core Standard	Found in CA Math Standards
Number and Operations - Fractions	5.NF.7b: Interpret division of a whole number by a unit fraction, and compute such quotients. For example, created a story context for 4 divided by (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain than 4 divided by (1/5) = 20 because 20 x (1/5) = 4.	Yes Grade 6 NS2.2
Measurement and Data	5.MD.1: Convert among different-sized standard measurement units with a given measurement system (e.g., convert 5 cm to 0.05 m) and use conversions in solving multi-step, real world problems.	Yes Grade 7 MG1.1

Grade 5 CA Mathematics Standards not found in the Grade 5 Common Core Standards

Strand	CA Math Standard	Found in Common Core Standards
1.0 Number Sense	1.2 Interpret percents as a part of a hundred; find decimal and percent equivalents for common fractions and explain why they represent the same value; compute a given percent of a whole number.	Yes 6.RP.3a: Make table 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 table 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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
1.0 Number Sense	1.3 Understand and compute positive integer powers of nonnegative integers; compute examples as repeated multiplication.	Yes 6.EE.1: Write and evaluate numerical expressions involving whole-number exponents.
1.0 Number Sense	1.4 Determine the prime factors of all numbers through 50 and write the numbers as the product of their prime factors by using exponents to show multiples of a factor (e.g., $24 = 2 \times 2 \times 2 \times 3 = 2^3 \times 3$).	Yes 4.OA.4: Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range is prime or composite.
1.0 Number Sense	1.5 Identify and represent on a number line decimals, fractions, mixed numbers, and positive and negative integers.	Yes 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. 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 then 0 is its own opposite. 6.NS.6b: Write interpret, and explain statements of order for rational number in real-world contexts.

Strand	CA Math Standard	Found in Common Core Standards
		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 the coordinate plane.
1.0 Algebra	1.1 Use information taken from a graph or equation to answer questions about a problem situation.	Yes 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 table, and relate these to the equation.
1.0 Algebra	1.2 Use a letter to represent an unknown number; write and evaluate simple algebraic expressions in one variable by substitution.	Yes 6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers.
1.0 Algebra	1.3 Know and use the distributive property in equations and expressions with variables.	Yes 6.EE.3: Apply the properties of operations to generate equivalent expressions.
1.0 Measurement and Geometry	1.1 Derive and use the formula for the area of a triangle and of a parallelogram by comparing it with the formula for the area of a rectangle (i.e., two of the same triangles make a parallelogram with twice the area; a parallelogram is compared with a rectangle of the same area by cutting and pasting a right triangle on the parallelogram).	Yes 6.G.1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangle or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
	1.2 Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area for these objects.	Yes 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.
2.0 Measurement and Geometry	2.2 Know that the sum of the angles of any triangle is 180° and the sum of the angles of any quadrilateral is 360° and use this information to solve problems.	Yes 8.G.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.
2.0 Measurement and Geometry	2.3 Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids.	Yes CCS does not specify drawing two-dimensional views of three-dimensional objects.

Strand	CA Math Standard	Found in Common Core Standards
		7.G.3: Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
1.2 Statistics, Data Analysis, and Probability	1.1 Know the concepts of mean, median, and mode; compute and compare simple examples to show that they may differ.	Yes 6.SP.5: Summarize numerical data sets in relation to their context, such as by: 6.SP.5a: Reporting the number of observations. 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.
1.2 Statistics, Data Analysis, and Probability	1.2 Organize and display single-variable data in appropriate graphs and representations (e.g., histogram, circle graphs) and explain which types of graphs are appropriate for various data sets.	Yes 6.SP.4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots. CCS does not mention circle graph.
1.2 Statistics, Data Analysis, and Probability	1.4 Identify ordered pairs of data from a graph and interpret the meaning of the data in terms of the situation depicted by the graph.	Yes 7.RP.2: Recognize and represent proportional relationships between quantities. 7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. 7.RP.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 7.RP.2c: Represent proportional relationships by equations.

Strand	CA Math Standard	Found in Common Core Standards
		7.RP.2d: Explain that a point (x,y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0,0) and (1,r) where r is the unit rate.

Analysis of *California Mathematics* Standards to *Common Core* Standards - Grade 6

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
Strand Number Sense	**CA Math Standard**				
1.0 Number Sense	1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers. Students solve problems involving fractions, ratios, proportions, and percentages.	The Number System	6.RP: (Cluster statement) Understand ratio concepts and use ratio reasoning to solve problems. 6.NS: (Cluster statement) Apply and extend previous understandings of numbers to the system of rational numbers.	Yes	Problems involving fractions are also included in 5.NF 1, 2, 3, 4, 6 and 7.
	1.1 Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line.	The Number System	6.NS.5: Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represents quantities in real-world contexts, explaining the meaning of zero 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. 6.NS.6a: Recognize opposite signs of numbers as indicating locations on opposite sides of 0 one a number line; recognize that the opposite of the opposite of a number is the number itself and that 0 is its own opposite. 6.NS.6b: Understand signs of number in ordered pairs as indicating locations in quadrants of	Yes	The content in this CCS is also mapped to CA. 5th grade AF1.4

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across both axes. **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.7: Understand ordering and absolute value of rational numbers.** **6.NS.7a: Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.** **6.NS.7b: Write, interpret, and explain statements of order for rational numbers in real-world contexts.** 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. 6.NS.7d: Distinguish comparisons of absolute value fro statements about order.		

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	1.2 Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations (*a/b, a* to *b*, *a:b*).	Ratio and Proportional Relationships	6.RP.1: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. 6.RP.2: Understand the concept of a unit rate *a/b* associated with a ratio *a:b* with *b* ≠ 0, and use rate language in the context of a ratio relationship.	Yes	7.RP.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
	1.3 Use proportions to solve problems (e.g., 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.			No	**7.RP.2: Recognize and represent proportional relationships between quantities.** 7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. 7.RP.2b: Identify constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **7.RP.2c: Represent proportional relationships by equations.** 7.RP.3: Use proportional relationships to solve multi-step ratio and percent problems. 7.G.1: Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					CCS does not reference cross-multiplication or multiplicative inverse. These are implied in the standards that require students to use operations and properties of numbers.
	1.4 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.	Ratio and Proportional Relationships	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.RP.3d: Use ratio reasoning of a quantity to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	Partial	7.RP-3 Use proportional relationships to solve multistep ratio and percent problems.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
2.0 Number Sense	2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division.			No	7.NS. (Cluster statement) Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.
	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.	The Number System	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.	Partial	5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

5.NF.2: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

5.NF.6: Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. |
| | 2.2 Explain the meaning of multiplication and division of positive fractions and perform the calculations (e.g., 5/8 ÷ 15/16 = 5/8 x 16/15 = 2/3). | The Number System | 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. | Yes | |
| | 2.3 Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations that use positive and | Expressions and Equations | 6.EE.3: Apply the properties of operations to generate equivalent expressions. | Partial | 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	negative integers and combinations of these operations.		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.		and subtraction on a horizontal or vertical number line. 7.NS.1a: Describe situations in which opposite quantities combine to make 0. 7.NS.1b: Understand $p + q$ as a number located $|q|$ from p, is the positive or negative direction depending upon 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. **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.** **7.NS.1d: Apply properties of operations as strategies to add and subtract rational numbers.** 7.NS.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **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**

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					distributive property, leading to products such as (-1)(-1) = 1 and the rule for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. **7.NS.2b: Understand that integers can be divided, provided the divisor is not zero, and every quotient of integers (with non-zero divisors) 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.** 7.NS.2c: Apply properties of operations as strategies to multiply and divide rational numbers. 7.NS.2d: Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. 7.EE.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	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 a common denominator to add two fractions or to find the reduced form for a fraction).	The Number System	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.	Partial	5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. CCS limits common factors to numbers less than or equal to 100. CCS limits least common multiple to numbers less than or equal to 12.
Strand Algebra and Functions	**CA Math Standard**				
1.0 Algebra and Functions	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. (Cluster statement) Reason about and solve one-variable equations and inequalities.	Yes	
	1.1 Write and solve one-step linear equations in one variable.	Expressions and Equations	6.EE.7: Solve real-world and mathematical problems by writing and solving equations in the form of $x + p = q$ and $px = q$ for cases in which p, q, and x are all nonnegative rational numbers.	Yes	CCS specifically reference real-world and mathematical problems.
	1.2 Write and evaluate an algebraic expression for a given situation, using up to three variables.	Expressions and Equations	**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-.2b: Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient);**	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			view one or more parts of an expression as a single entity. 6.EE.2c: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-word 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).		
	1.3 Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process.	Expressions and Equations	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.** 6.EE.2a: Write expressions that record operations with numbers and with letters standing for numbers. 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. **6.EE.2c: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-word problems. Perform arithmetic operations, including those**	Yes	The use of the commutative, associative, and distributive properties is implied in 6.EE-3.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			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 properties of operations to generate equivalent expression.		
			6.EE.4: Identify when two expressions are equivalent (i.e., when the two expression name the same number regardless of which value is substituted into them.)		
		Mathematical Practices	6.MP: Construct valid arguments and critique the reasoning of others.		
	1.4 Solve problems manually by using the correct order of operations or by using a scientific calculator.	Expressions and Equations	6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers.	Yes	CCS does not reference scientific calculator.
			6.EE.2a: Write expressions that record operations with numbers and with letters standing for numbers.		
			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.		
			6.EE.2c: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-word problems. Perform arithmetic operations, including those		

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			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.		
2.0 Algebra and Functions	2.0 Students analyze and use tables, graphs, and rules to solve problems involving rates and proportions.	Ratio and Proportional Relationships	6.RP. (Cluster statement) Understand ratio concepts and use ration reasoning to solve problems. **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.	Partial	7.RP.2: Recognize and represent proportional relationships between quantities. 7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. **7.RP.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.** 7.RP.2c: Represent proportional relationships by equations. **7.RP.2d: Explain what a point (*x, y*) on the graph of proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where *r* is the unit rate.**

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			6.RP.3d: Use ratio reasoning of a quantity to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.		
	2.1 Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches).	Ratio and Proportional Relationships	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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.**	Partial	5.MD.1: Convert among different-sized measurement units within a given measurement system and use these conversions in solving multi-step, real world problems.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	2.2 Demonstrate an understanding that *rate* is a measure of one quantity per unit value of another quantity.	Ratio and Proportional Relationships	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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	Partial	7.RP.2: Recognize and represent proportional relationships between quantities. **7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.** 7.RP.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 7.RP.2c: Represent proportional relationships by equations.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	2.3 Solve problems involving rates, average speed, distance, and time.	Ratio and Proportional Relationships	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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	Yes	
3.0 Algebra and Functions	3.0 Students investigate geometric patterns and describe them algebraically.	Expressions and Equations	6.EE.6: Use variables to represent 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.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	3.1 Use variables in expressions describing geometric quantities (e.g., $P = 2w + 2l$, $A = 1/2bh$, $C =$ pd - the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively).	Expressions and Equations	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-.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. **6.EE.2c: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-word 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).**	Yes	
	3.2 Express in symbolic form simple relationships arising from geometry.	Expressions and Equations	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.2b: Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			more parts of an expression as a single entity. **6.EE.2c: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-word 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).**		
Strand Measurement and Geometry	**CA Math Standard**				
1.0 Measurement and Geometry	1.0 Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems.	Geometry	6.G. (Cluster statement) Solve real-world and mathematical problems involving area, surface area, and volume	Yes	
	1.1 Understand the concept of a constant such as π; know the formulas for the circumference and area of a circle.	Geometry	7.G.4: Know the formulas for the area and circumference of a circle and use them to solve problems: give an informal derivation of the relationship between the circumference and area of a circle.	Yes	
	1.2 Know common estimates of π (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements.	Geometry	7.G.4: Know the formulas for the area and circumference of a circle and use them to solve problems: give an informal derivation of the relationship between the circumference and area of a circle.	Yes	
		Mathematical Practices	7.MP.5: Use appropriate tools strategically.		

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	1.3 Know and use the formulas for the volume of triangular prisms and cylinders (area of base × height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid.	Geometry	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 the volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	Partial	7.G.6: Solve real world and mathematical problems involving area, volume and surface area of two- and three- dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. 8.G.9: Know the formulas for volumes of cone, cylinders, and spheres and use them to solve real-world and mathematical problems.
2.0 Measurement and Geometry	2.0 Students identify and describe the properties of two-dimensional figures.			No	5.G.3: Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. 5.G.4: Classify two-dimensional figures in a hierarchy based on properties.
	2.1 Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms.			No	7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
	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.			No	7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
	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).			No	7.G.2: Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					triangle, more than one triangle, or no triangle. 7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
Strand Statistics, Data Analysis, and Probability	**CA Math Standard**				
1.0 Statistics, Data Analysis, and Probability	1.0 Students compute and analyze statistical measurements for data sets.	Statistics and Probability	6.SP: (Cluster statement) Develop understanding of statistical variability.	Yes	
	1.1 Compute the range, mean, median, and mode of data sets.	Statistics and Probability	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 value vary with a single number.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	1.2 Understand how additional data added to data sets may affect these computations of measures of central tendency.	Statistics and Probability	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.	Partial	8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe such patterns as clustering, outliers, positive or negative association, linear association and nonlinear association. CCS does not specifically sate knowing the effect of additional data. CCS includes describing patterns as clustering, outliers, positive or negative association, linear association and nonlinear association.
	1.3 Understand how the inclusion or exclusion of outliers affects measures of central tendency.			No	8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe such patterns as clustering, outliers, positive or negative association, linear association and nonlinear association.
	1.4 Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.	Statistics and Probability	6.SP.5d: Summarize numerical data set in relation to their context, such as by 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.	Yes	
2.0 Statistics, Data Analysis, and Probability	2.0 Students use data samples of a population and describe the characteristics and limitations of the samples.	Statistics and Probability / Statistics and Probability	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. 7.SP: (Cluster statement) Use random sampling to draw inferences about a population.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	2.1 Compare different samples of a population with the data from the entire population and identify a situation in which it makes sense to use a sample.			No	7.SP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
	2.2 Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population.			No	7.SP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
	2.3 Analyze 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.	Statistics and Probability	6.SP.5a: Summarize numerical data sets in relation to their context by reporting the number of observations 6.SP.5b: Summarize numerical data sets in relation to their context by describing the nature of the attribute under investigation, including how it was measured and its units of measurement. **6.SP.5c: Summarize numerical data sets in relation to their context by 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**	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			with reference to the context in which the data were given. 6.SP.5d: Summarize numerical data sets in relation to 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.		
	2.4 Identify data that represent sampling errors and explain why the sample (and the display) might be biased.	Statistics and Probability	**6.SP.5a: Summarize numerical data sets in relation to their context by reporting the number of observations** **6.SP.5b: Summarize numerical data sets in relation to their context by describing the nature of the attribute under investigation, including how it was measured and its units of measurement.** **6.SP.5c: Summarize numerical data sets in relation to their context by 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 with reference to the context in which the data were given.** 6.SP.5d: Summarize numerical data sets in relation to 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.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	2.5 Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims.	Mathematical Practices	6.MP.2: Reason abstractly and quantitatively. MP-3 Construct viable arguments and critiques the reasoning of others.	Yes	
3.0 Statistics, Data Analysis, and Probability	3.0 Students determine theoretical and experimental probabilities and use these to make predications about events.			No	7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. **7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.** 7SP.7a: Develop uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. 7SP.7b: Develop a probability model (which may not be uniform) by observing frequencies in data generated form a chance process. 7.SP.8: Find probabilities of compound events using organized list, tables, tree diagrams, and simulation. 7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					outcomes in the sample space for which the compound event occurs.

7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g.," rolling double sixes"), identify the outcomes in the sample space which compose the event.

7.SP.8c: Design and use a simulation to generate frequencies for compound events. |
| | 3.1 Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome. | | | No | 7.SP.8: Find probabilities of compound events using organized list, tables, tree diagrams, and simulation.

7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g.," rolling double sixes"), identify the outcomes in the sample space which compose the event.

7.SP-8c Design and use a simulation to generate frequencies for compound events. |
| | 3.2 Use data to estimate the probability of future events (e.g., batting averages or number of | | | No | 7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	accidents per mile driven).				it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
	3.3 Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 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.			No	7.SP.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
	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.			No	**7.SP.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.** **7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.** **7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.** 7.SP.8c: Design and use a simulation to generate frequencies for compound events.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	3.5 Understand the difference between independent and dependent events.			No	7.SP.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. 7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. 7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. **7.SP.8c: Design and use a simulation to generate frequencies for compound events.**
Strand Mathematical Reasoning	**CA Math Standard**				
1.0 Mathematical Reasoning	1.0 Students make decisions about how to approach problems.	Mathematical Practices	6.MP.1: Make sense of problems and preserve in solving them	Yes	
	1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	Mathematical Practices	6.MP.7: Look for and make use of structure. 6.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	1.2 Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	Mathematical Practices	6.MP.2: Reason abstractly and quantitatively. 6.MP.3: Construct viable arguments and critique the reasoning of others.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	1.3 Determine when and how to break a problem into simpler parts.	Mathematical Practices	6.MP.1: Make sense of problems and preserve in solving them. 6.MP.7: Look for and make use of structure.	Yes	
2.0 Mathematical Reasoning	2.0 Students use strategies, skills, and concepts in finding solutions.	Mathematical Practices	6.MP.1: Make sense of problems and preserve in solving them. 6.MP.5: Use appropriate tools strategically. 6.MP.7: Look for and make use of structure. 6.MP.8: Look for and express regularity in repeated reasoning	Yes	
	2.1 Use estimation to verify the reasonableness of calculated results.	Mathematical Practices	6.MP.1: Make sense of problems and preserve in solving them.	Yes	
	2.2 Apply strategies and results from simpler problems to more complex problems.	Mathematical Practices	6.MP.7: Look for and make use of structure. 6.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	Mathematical Practices	6.MP.2: Reason abstractly and quantitatively. 6.MP.5: Use appropriate tools strategically. 6.MP.7: Look for and make use of structure. 6.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	2.4 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.	Mathematical Practices	6.MP.4: Model with mathematics.	Yes	
	2.5 Express the solution clearly and logically by using the appropriate mathematical notation and terms and	Mathematical Practices	6.MP.6: Attend to precision.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	clear language; support solutions with evidence in both verbal and symbolic work.				
	2.6 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.			No	
	2.7 Make precise calculations and check the validity of the results from the context of the problem.	Mathematical Practices	6.MP.6: Attend to precision.	Yes	
3.0 Mathematical Reasoning	3.0 Students move beyond a particular problem by generalizing to other situations.	Mathematical Practices	6.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	3.1 Evaluate the reasonableness of the solution in the context of the original situation.	Mathematical Practices	6.MP.2: Reason abstractly and quantitatively. 6.MP.3: Construct viable arguments and critique the reasoning of others.	Yes	
	3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.	Mathematical Practices	6.MP.7: Look for and make use of structure. 6.MP.8: Look for and express regularity in repeated reasoning	Yes	
	3.3 Develop generalizations of the results obtained and the strategies used and apply them in new problem situations.	Mathematical Practices	6.MP.5: Use appropriate tools strategically. 6.MP.7: Look for and make use of structure. 6.MP.8: Look for and express regularity in repeated reasoning.	Yes	

Grade 6 Common Core Standards not found in 6th Grade CA Mathematics Standards

Domain	Common Core standard	Found in CA Math standards
The Number System	6. NS.5b: 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.	Yes
The Number System	6.NS.7c: Understand the absolute value of a rational number as its distance fro 0 o the 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.	Yes Grade 7- NS 2.5
The Number System	7.NS.7d: Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance of less than -30 dollars represents a debt greater than 30 dollars.	Yes Grade 7- NS 2.5
The Number System	6.NS.8: Solve real-world and mathematical problems by graphing points in all four quadrants. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	Yes Grade 7- NS 2.5
Expressions and Equations	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.	Yes Grade 7- AF 1.1
Expressions and Equations	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, tables, and relate these to an equation.	Yes Grade 7- AF 1.1 and A.F. 1.5
Geometry	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.	Yes Grade 7- MG 2.2
Geometry	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.	Yes Grade 7- MG 3.2
Geometry	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.	Yes Grade 7- MG 3.5

Grade 6 CA Mathematics Standards not found in the Grade 6 Common Core Standards

Strand	CA Math Standard	Found in CCS
1.0 Number Sense	1.3 Use proportions to solve problems (e.g., 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.	Yes **7.RP.2: Recognize and represent proportional relationships between quantities.** 7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. 7.RP.2b: Identify constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **7.RP.2c: Represent proportional relationships by equations.** 7.RP.3: Use proportional relationships to solve multi-step ratio and percent problems. 7.G.1: Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. CCS does not reference cross-multiplication or multiplicative inverse. These are implied in the standards that require students to use operations and properties of numbers.
2.0 Number Sense	2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division.	Yes 7.NS. (Cluster statement) Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.
2.0 Measurement and Geometry	2.0 Students identify and describe the properties of two-dimensional figures.	Yes 5.G.3: Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. 5.G.4: Classify two-dimensional figures in a hierarchy based on properties.
	2.1 Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms.	Yes 7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
	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.	Yes 7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

Strand	CA Math Standard	Found in CCS
	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.2: Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. 7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
1.0 Statistics, Data Analysis, and Probability	1.3 Understand how the inclusion or exclusion of outliers affects measures of central tendency.	Yes 8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe such patterns as clustering, outliers, positive or negative association, linear association and nonlinear association.
2.0 Statistics, Data Analysis, and Probability	2.1 Compare different samples of a population with the data from the entire population and identify a situation in which it makes sense to use a sample.	Yes 7.SP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
	2.2 Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population.	Yes 7.SP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
3.0 Statistics, Data Analysis, and Probability	3.0 Students determine theoretical and experimental probabilities and use these to make predications about events.	Yes 7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. **7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.** 7SP.7a: Develop uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. 7SP.7b: Develop a probability model (which may not be uniform) by observing frequencies in data generated form a chance process.

Strand	CA Math Standard	Found in CCS
		7.SP.8: Find probabilities of compound events using organized list, tables, tree diagrams, and simulation. 7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. 7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g.," rolling double sixes"), identify the outcomes in the sample space which compose the event. **7.SP.8c: Design and use a simulation to generate frequencies for compound events.**
3.0 Statistics, Data Analysis, and Probability	3.1 Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome.	Yes 7.SP.8: Find probabilities of compound events using organized list, tables, tree diagrams, and simulation. 7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. 7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g.," rolling double sixes"), identify the outcomes in the sample space which compose the event. 7.SP-8c Design and use a simulation to generate frequencies for compound events.
3.0 Statistics, Data Analysis, and Probability	3.2 Use data to estimate the probability of future events (e.g., batting averages or number of accidents per mile driven).	Yes 7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
3.0 Statistics, Data Analysis, and Probability	3.3 Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 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.	Yes 7.SP.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

Strand	CA Math Standard	Found in CCS
3.0 Statistics, Data Analysis, and Probability	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.	Yes **7.SP.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.** **7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.** **7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.** 7.SP.8c: Design and use a simulation to generate frequencies for compound events.
3.0 Statistics, Data Analysis, and Probability	3.5 Understand the difference between independent and dependent events.	7.SP.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. 7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. 7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. **7.SP.8c: Design and use a simulation to generate frequencies for compound events.**

Analysis of *California Mathematics* Standards to *Common Core* Standards
Grade 7

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
Strand Number Sense	**CA Math Standard**				
1.0 Number Sense	1.0 Students know the properties of, and compute with, rational numbers expressed in a variety of forms.	The Number System	**7.NS: Cluster statement- Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.** 7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers: present addition and subtraction on a horizontal or vertical number line. 7.NS.1a: Describe situations in which opposite quantities combine to make 0. 7.NS.1b: Understand $p + q$ as a number located $|q|$ from p, is the positive or negative direction depending upon 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. 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 f their difference, and apply this principal in real-world contexts.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			7.NS.1d: Apply properties of operations as strategies to add and subtract rational numbers.		
			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 rule for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.		
			7.NS.2b: Understand that integers can be divided, provided the divisor is not zero, and every quotient of integers (with non-zero divisors) 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.		
			7.NS.2c: Apply properties of operations as strategies to multiply and divide rational numbers.		
			7.NS.2d: Convert a rational number to a decimal using long division: know that the decimal form of a rational number terminates in 0s or eventually repeats.		
			7.NS.3: Solve real-world problems involving the four operations with rational numbers.		

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	1.1 Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.			No	8.EE.3: Use numbers expressed in the form of a single digit times an integer power to 10 to estimate very large or very small quantities, and to express how many times as much one is that the other. 8.EE.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 and very small quantities. (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
	1.2 Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.	The Number System	**7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers: present addition and subtraction on a horizontal or vertical number line.** 7.NS.1a: Describe situations in which opposite quantities combine to make 0 **7.NS.1b: Understand $p + q$ as a number located |q| from p, is the positive or negative direction depending upon 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.** **7.NS.1c: Understand subtraction of rational numbers as adding the additive inverse, $p - q = p +$ (-**	Yes	8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			q). Show that the distance between two rational numbers on the number line is the absolute value f their difference, and apply this principal in real-world contexts. **7.NS-1d: Apply properties of operations as strategies to add and subtract rational numbers.** 7.NS.2: Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers: present addition and subtraction on a horizontal or vertical number line. 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 rule for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. 7.NS.2b: Understand that integers can be divided, provided the divisor is not zero, and every quotient of integers (with non-zero divisors) 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.		

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			7.NS.2c: Apply properties of operations as strategies to multiply and divide rational numbers.		
			7.NS.2d: Convert a rational number to a decimal using long division: know that the decimal form of a rational number terminates in 0s or eventually repeats.		
	1.3 Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.	The Number System	7.NS.2: Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers: present addition and subtraction on a horizontal or vertical number line.

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 rule for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

7.NS.2b: Understand that integers can be divided, provided the divisor is not zero, and every quotient of integers (with non-zero divisors) 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.

7.NS.2c: Apply properties of operations as strategies to multiply and divide rational numbers. | Partial | CCS does not include converting fractions to percents. |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			7.NS.2d: Convert a rational number to a decimal using long division: know that the decimal form of a rational number terminates in 0s or eventually repeats.		
		Expressions and Equations	7.EE.2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities are related. 7.EE.3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation or estimation strategies.		
	1.4 Differentiate between rational and irrational numbers.			No	8.NS.1: Understand informally that every number has a decimal expansion: the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.
	1.5 Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions.	The Number System	7.NS.2: Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers: present addition and subtraction on a horizontal or vertical number line. 7.NS.2a: Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			to satisfy the properties of operations, particularly the distributive property leading to products such as $(-1)(-1) = 1$ and the rule for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. 7.NS.2b: Understand that integers can be divided, provided the divisor is not zero, and every quotient of integers (with non-zero divisors) 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. 7.NS.2c: Apply properties of operations as strategies to multiply and divide rational numbers. **7.NS.2d: Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.**		
	1.6 Calculate the percentage of increases and decreases of a quantity.	Ratios and Proportional Relationships	7.RP.3: Uses proportional relationships to solve multistep ratio and percent problems.	Yes	
	1.7 Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest.	Ratios and Proportional Relationships	7.RP.3: Uses proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*	Partial	CCS does not reference compound interest. Example included because it clarifies the standard.
2.0 Number Sense	2.0 Students use exponents, powers, and roots and use exponents in working with fractions.			No	Fractions are not specifically mentioned. 8.EE: Cluster statement- Work with radicals and integer exponents.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	2.1 Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.			No	8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.* CCS example is included to clarify the standard.
	2.2 Add and subtract fractions by using factoring to find common denominators.			No	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. 5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. CCS does not specifically mention using factoring to find common denominators.
	2.3 Multiply, divide, and simplify rational numbers by using exponent rules.	Expressions and Equations		No	8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	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.			No	8.NS.2: Use rational approximations of irrational number to compare size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. 8.EE.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 toots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
	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.	The Number System	7.NS.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers: present addition and subtraction on a horizontal or vertical number line. 7.NS.1a: Describe situations in which opposite quantities combine to make 0. **7.NS.1b: Understand $p + q$ as a number located $|q|$ from p, is the positive or negative direction depending upon whether q is positive or negative. Show that a number an its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.** **7.NS.1c: Understand subtraction of rational numbers as adding**	Partial	**6.NS.7: Understand ordering and absolute value of rational numbers.** 6.NS.7a: Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. 6.NS.7b: Write, interpret, and explain statements of order for rational numbers in real-world contexts. **6.NS.7c: Understand the absolute value of a rational number as its distance from 0 to the number line; interpret absolute value as magnitude for a positive or negative quantity in a real world situation.** **6.NS.7d: Distinguish comparisons of absolute value from statements about order.**

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			the additive inverse, $p – q = p + (-q)$. **Show that the distance between two rational numbers on the number line is the absolute value f their difference, and apply this principal in real-world contexts.** 7.NS.1d: Apply properties of operations as strategies to add and subtract rational numbers.		6.NS.8: Solve real-world and mathematical problems by graphing points in all four quadrants. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
Strand **Algebra and Functions**	**CA Math Standard**				
1.0 Algebra and Functions	1.0 Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs.	Expressions and Equations	**7.EE: Cluster statement- Solve real-life and mathematical problems using numerical and algebraic expression and equations.** 7.EE.4a: Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. 7.EE.4b: Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$ where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. **7.EE.4b: Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the**	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			solution set of the inequality and interpret it in the context of the problem.		
	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).	Expressions and Equations	7.EE.4: Use variables to represent quantities in a real-world and mathematical problems and construct simple equations and inequalities to solve problems about the quantities.	Partial	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.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. 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 independent variable. Analyze the relationship between the independent and dependent variables using graphs and tables and relate these to the equations.
	1.2 Use the correct order of operations to evaluate algebraic expressions such as $3(2x + 5)^2$.	Expressions and Equations Expressions and Equations	7.EE.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Yes	
	1.3 Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used.	Expressions and Equations	7.EE.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Yes	
		Mathematical Practices	MP.3: Construct viable arguments and critique the reasoning of others.		

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	1.4 Use algebraic terminology (e.g., variable, equation, term, coefficient, inequality, expression, constant) correctly.	Expressions and Equations	6.EE.2: Write, read, and evaluate expressions involving whole-number exponents. 6.EE.2a: Write expressions that record operations with numbers and with letters standing for numbers. **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.** 6.EE.2c: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-word 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).	Yes	
	1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.			No	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 independent variable. Analyze the relationship between the independent and dependent variables using graphs and tables and relate these to the equations.
2.0 Algebra and Functions	2.0 Students interpret and evaluate expressions involving integer powers and simple roots.			No	8.EE: Cluster statement- Work with radicals and integer exponents.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	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.			No	There is no mention of "Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse." 6.EE.2: Write, read, and evaluate expressions involving whole-number exponents. 6.EE.2a: Write expressions that record operations with numbers and with letters standing for numbers. 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. **6.EE.2c: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-word 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.
	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.			No	
3.0 Algebra and Functions	Students graph and interpret linear and some nonlinear functions.	Functions		No	8.F: Cluster statement- Use functions to model relationships between quantities.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					8.F.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. 8.F.2: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions.) 8.F.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.
	3.1 Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems.			No	
	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).			No	
	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.			No	8.EE.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. 8.EE.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.
	3.4 Plot the values of quantities whose ratios are always the same (e.g., cost to			No	8.EE.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	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.				two different proportional relationships represented in different ways. 8.SP.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.
4.0 Algebra and Functions	4.0 Students solve simple linear equations and inequalities over the rational numbers.	Expressions and Equations	7.EE: Cluster statement-Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	Partial	8.EE.7: Solve linear equations in one variable.
	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.	Expressions and Equations	7.EE.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **7.EE.4a: Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.** **7.EE.4b: Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$ where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.**	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
		Mathematical Practices	7.MP.1: Make sense of problems and preserve in solving them.		
	4.2 Solve multi step problems involving rate, average speed, distance, and time or a direct variation.			No	CCS does not specifically reference average speed, distance, and time. 6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables or 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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
Strand Measurement and Geometry	**CA Math Standard**				
1.0 Measurement and Geometry	1.0 Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.			No	CCS does not reference conversion between measurement systems. 5.MD: Cluster statement- Convert like measurement units within a given

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					measurement system.

5.MD.1: Convert among different-sized measurement units within a given measurement system and use these conversions in solving multi-step, real world problems.

6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables or 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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. |
| | 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). | | | No | CCS does not reference comparing measurement systems.

6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					tables or 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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
	1.2 Construct and read drawings and models made to scale.	Geometry	7.G1: Solve problems involving scale drawings of geometric figures, including actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Yes	
	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.	Ratios and Proportional Reasoning	6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables or equivalent ratios, tape diagrams, double number line diagrams or equations. 6.RP.3a: Make tables of equivalent ratios relating quantities with whole-number measurements,	Partial	CCS does not reference dimensional analysis.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.**		
2.0 Measurement and Geometry	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.	Geometry	7.G.6: Solve real world and mathematical problems involving area, volume and surface area of two-and three- dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.	Partial	CCS does not reference how perimeter, area, and volume are affected by changes of scale.
	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.	Geometry	7. G.4: Know the formulas for the area and circumference of a circle and use them to solve problems: give an informal derivation of the relationship between the circumference and area of a circle. 7.G.6: Solve real world and mathematical problems involving area, volume and surface area of two-and three- dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.	Partial	8.G.9: Know the formulas for volumes of cone, cylinders, and spheres and use them to solve real-world and mathematical problems.

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	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.	Geometry	7.G.6: Solve real world and mathematical problems involving area, volume and surface area of two-and three- dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.	Partial	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.
	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.	Geometry	7.G.6: Solve real world and mathematical problems involving area, volume and surface area of two-and three- dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.	Partial	Does not mention using an "object built from rectangular solids" or the two scale factor conditions.
	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 $[1 \text{ ft}^2] = [144 \text{ in}^2]$, 1 cubic inch is approximately 16.38 cubic centimeters or $[1 \text{ in}^3] = [16.38 \text{ cm}^3]$).			No	CCS does not reference change of scale to the units used.

6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables or 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 |

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					quantity); solve problems involving finding the whole, given a part and the percent. **6.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.**
3.0 Measurement and Geometry	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.			No	CCS does not reference by identifying attributes of figures. 8.G: Geometry Cluster statement- Understand and apply the Pythagorean Theorem.
	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.			No	
	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.	Geometry		No	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. 8.G.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. 8.G.3: Describe the effect of dilations, translations, rotations, and reflections of two-dimensional figures

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					using coordinates. 8.G.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.
	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.			No	8.G.6: Explain a proof of the Pythagorean Theorem and its converse. 8.G.7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangle in real-world and mathematical problems in two and three dimensions.
	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.			No	8.G.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.
	3.5 Construct two-dimensional patterns for three-dimensional models, such as cylinders, prisms, and cones.			No	6.G.4: Represent three-dimensional figures using nets made up of rectangles and triangles, and use nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
	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).			No	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
Strand **Statistics, Data Analysis, and Probability**	**CA Math Standard**				
1.0 Statistics, Data Analysis, and Probability	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.	Statistics and Probability	7.SP.2: Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variations in estimates of predictions.	Partial	8.SP.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.
	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.	Statistics and Probability		No	6.SP.4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots. 6.SP.5: Summarize numerical sets of data in relation to their context.
	1.2 Represent two numerical variables on a scatter plot 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).	Statistics and Probability	7.SP.3: Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. 7.SP.4: Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.	Partial	8.SP.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.
	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.			No	6.SP.5: Summarize numerical data sets in relation to their context, such as by: 6.SP.5a: Reporting the number of observations. 6.SP.5b: Describing the nature of the

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
					attribute under investigation, including how it was measured and its units of measurements.
					6.SP.5c: Summarize numerical data sets in relation to their context by 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 with reference to the context in which the data were given.
					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.
Strand Mathematical Reasoning	**CA Math Standard**				
1.0 Mathematical Reasoning	1.0 Students make decisions about how to approach problems.	Mathematical Practices	7.MP.1: Make sense of problems and preserve in solving them.	Yes	
	1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	Mathematical Practices	7.MP.7: Look for and make use of structure. 7.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	1.2 Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	Mathematical Practices	7.MP.2: Reason abstractly and quantitatively. 7.MP.3: Construct viable arguments and critique the reasoning of others.	Yes	
	1.3 Determine when and how to break a problem into simpler parts.	Mathematical Practices	7.MP.1: Make sense of problems and preserve in solving them. 7.MP.7: Look for and make use of structure.	Yes	
2.0 Mathematical Reasoning	2.0 Students use strategies, skills, and concepts in finding solutions.	Mathematical Practices	7.MP.1: Make sense of problems and preserve in solving them.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
			7.MP.5: Use appropriate tools strategically. 7.MP.7: Look for and make use of structure. 7.MP.8: Look for and express regularity in repeated reasoning.		
	2.1 Use estimation to verify the reasonableness of calculated results.	Mathematical Practices	7.MP.1: Make sense of problems and preserve in solving them. 7.MP.2: Reason abstractly and quantitatively.	Yes	
	2.2 Apply strategies and results from simpler problems to more complex problems.	Mathematical Practices	7.MP.7: Look for and make use of structure. 7.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	Mathematical Practices	7.MP.2: Reason abstractly and quantitatively. 7.MP.5: Use appropriate tools strategically. 7.MP.7: Look for and make use of structure. 7.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	2.4 Make and test conjectures by using both inductive and deductive reasoning.	Mathematical Practices	7.MP.2: Reason abstractly and quantitatively. 7.MP.3: Construct valid arguments and critique the reasoning of others.	Yes	
	2.5 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.	Mathematical Practices	7.MP.4: Model with mathematics.	Yes	
	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	Mathematical Practices	7.MP.6: Attend to precision.	Yes	

Strand	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to the CCS
	work.				
	2.7 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	Mathematical Practices	7.MP.6: Attend to precision.	Yes	
	2.8 Make precise calculations and check the validity of the results from the context of the problem.	Mathematical Practices	7.MP.6: Attend to precision.	Yes	
3.0 Mathematical Reasoning	3.0 Students determine a solution is complete and move beyond a particular problem by generalizing to other situations.	Mathematical Practices	7.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	3.1 Evaluate the reasonableness of the solution in the context of the original situation.	Mathematical Practices	7.MP.2: Reason abstractly and quantitatively. 7.MP.3: Construct viable arguments and critique the reasoning of others.	Yes	
	3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.	Mathematical Practices	7.MP.8: Look for and express regularity in repeated reasoning.	Yes	
	3.3 Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.	Mathematical Practices	7.MP.5: Use appropriate tools strategically. 7.MP.7: Look for and make use of structure. 7.MP.8: Look for and express regularity in repeated reasoning.	Yes	

Grade 7 Common Core Standards not found in 7th Grade CA Mathematics Standards

Domain	Common Core standard	Found in CA Math standards
Ratios and Proportional Reasoning	7.RP.1: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units	Yes 6th Grade- NS 1.2
Ratios and Proportional Reasoning	7.RP.2: Recognize and represent proportional relationships between quantities.	Yes 6th Grade- NS 1.2
Ratios and Proportional Reasoning	7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	Yes 6th Grade- NS 1.3 and AF 2.2
Ratios and Proportional Reasoning	7.RP.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	Yes 6th Grade- AF 2.0
Ratios and Proportional Reasoning	7.RP.2c: Represent proportional relationships by equations.	Yes 6th Grade- NS 1.3
Ratios and Proportional Reasoning	7.RP.2d: Explain what a point (x, y) on the graph of proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.	Yes 6th Grade- AF 2.0
Geometry	7.G.2: Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	Yes 6th Grade- MG 2.3
Geometry	7.G.3: Describe the two-dimensional figures that result from slicing three-dimensional figure, as in plane sections of right rectangular prisms and right triangular prisms.	No
Geometry	7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	Yes 6th Grade- MG 2.3
Statistics and Probability	7.SP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population for a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	Yes 6th Grade- SDAP 2.1 and 2.2
Statistics and Probability	7.SP.5: Understand that the probability of a chance event is a number between o and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event is neither unlikely or likely, and a probability near 1 indicates a likely event.	Yes 6th Grade- SDAP 3.3
Statistics and Probability	7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.	Yes 6th Grade- SDAP 3.0 and 3.2
Statistics and Probability	7.SP.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.	Yes 6th Grade- SDAP 3.0

Domain	Common Core standard	Found in CA Math standards
Statistics and Probability	7. SP.7a: Develop uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.	Yes 6th Grade- SDAP 3.0
Statistics and Probability	7. SP.7b: Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.	
Statistics and Probability	7. SP.8: Find probabilities of compound events using organized list, tables, tree diagrams, and simulation.	Yes 6th Grade- SDAP 3.1
Statistics and Probability	7. SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	Yes 6th Grade- SDAP 3.1 and 3.4
Statistics and Probability	7. SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g.," rolling double sixes"), identify the outcomes in the sample space which compose the event.	Yes 6th Grade- SDAP 3.1
Statistics and Probability	7. SP.8c: Design and use a simulation to generate frequencies for compound events.	6th Grade- SDAP 3.0

Grade 7 CA Mathematics Standards not found in the 7th grade Common Core Standards

Strand	CA Math Standard	Found in Common Core Standards
1.0 Number Sense	1.1 Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.	Yes. 8.EE.3: Use numbers expressed in the form of a single digit times an integer power to 10 to estimate very large or very small quantities, and to express how many times as much one is that the other. 8.EE.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 and very small quantities. (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
1.0 Number Sense	1.4 Differentiate between rational and irrational numbers.	Yes. 8.NS.1: Understand informally that every number has a decimal expansion: the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.
2.0 Number Sense	2.0 Students use exponents, powers, and roots and use exponents in working with fractions.	Yes. Fractions are not specifically mentioned. 8.EE: Cluster statement- Work with radicals and integer exponents.
2.0 Number Sense	2.1 Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.	Yes. CCS example is included to clarify the standard. 8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.*
2.0 Number Sense	2.2 Add and subtract fractions by using factoring to find common denominators.	Yes. CCS does not specifically mention using factoring to find common denominators. 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. 5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Strand	CA Math Standard	Found in Common Core Standards
2.0 Number Sense	2.3 Multiply, divide, and simplify rational numbers by using exponent rules.	Yes. 8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.
2.0 Number Sense	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.	Yes. 8.NS.2: Use rational approximations of irrational number to compare size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. 8.EE.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 toots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
1.0 Algebra and Functions	1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.	Yes. 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 independent variable. Analyze the relationship between the independent and dependent variables using graphs and tables and relate these to the equations.
2.0 Algebra and Functions	2.0 Students interpret and evaluate expressions involving integer powers and simple roots.	Yes. 8.EE: Cluster statement- Work with radicals and integer exponents.
2.0 Algebra and Functions	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.	Yes. There is no mention of "Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse." 6.EE.2: Write, read, and evaluate expressions involving whole-number exponents. 6.EE.2a: Write expressions that record operations with numbers and with letters standing for numbers. 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. **6.EE.2c: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-word 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).**

Strand	CA Math Standard	Found in Common Core Standards
		6.EE.3: Apply the properties of operations to generate equivalent expressions.
2.0 Algebra and Functions	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.	
3.0 Algebra and Functions	Students graph and interpret linear and some nonlinear functions.	Yes. 8.F: Cluster statement- Use functions to model relationships between quantities. 8.F.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. 8.F.2: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions.) 8.F.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.
3.0 Algebra and Functions	3.1 Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems.	No.
3.0 Algebra and Functions	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).	No.
3.0 Algebra and Functions	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.	Yes. 8.EE.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. 8.EE.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.
3.0 Algebra and Functions	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.	Yes. 8.EE.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. 8.SP.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.

Strand	CA Math Standard	Found in Common Core Standards
4.0 Algebra and Functions	4.2 Solve multi step problems involving rate, average speed, distance, and time or a direct variation.	Yes. CCS does not specifically reference average speed, distance, and time. 6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables or 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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
1.0 Measurement and Geometry	1.0 Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.	Yes. CCS does not reference conversion between measurement systems. 5.MD: Cluster statement- Convert like measurement units within a given measurement system. 5.MD.1: Convert among different-sized measurement units within a given measurement system and use these conversions in solving multi-step, real world problems. 6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables or 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.

Strand	CA Math Standard	Found in Common Core Standards
		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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
	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).	Yes. CCS does not reference comparing measurement systems. 6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables or 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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
2.0 Measurement and Geometry	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 $[1 \text{ ft}^2] = [144 \text{ in}^2]$, 1 cubic inch is approximately 16.38 cubic centimeters or $[1 \text{ in}^3] = [16.38 \text{ cm}^3]$).	Yes. CCS does not reference change of scale to the units used. 6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables or 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.

Strand	CA Math Standard	Found in Common Core Standards
		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.RP.3d: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.**
3.0 Measurement and Geometry	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.	Yes. CCS does not reference by identifying attributes of figures. 8.G: Geometry Cluster statement- Understand and apply the Pythagorean Theorem.
3.0 Measurement and Geometry	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.	No.
3.0 Measurement and Geometry	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.	Yes. 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. 8.G.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. 8.G.3: Describe the effect of dilations, translations, rotations, and reflections of two-dimensional figures using coordinates. 8.G.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.
3.0 Measurement and Geometry	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.	Yes. 8.G.6: Explain a proof of the Pythagorean Theorem and its converse. 8.G.7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangle in real-world and mathematical problems in two and three dimensions.

Strand	CA Math Standard	Found in Common Core Standards
3.0 Measurement and Geometry	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.	Yes. 8.G.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.
3.0 Measurement and Geometry	3.5 Construct two-dimensional patterns for three-dimensional models, such as cylinders, prisms, and cones.	Yes. 6.G.4: Represent three-dimensional figures using nets made up of rectangles and triangles, and use nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
3.0 Measurement and Geometry	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).	No.
1.0 Statistics, Data Analysis, and Probability	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.	Yes. 6.SP.4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots. 6.SP.5: Summarize numerical sets of data in relation to their context
	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.	Yes. 6.SP.5: Summarize numerical data sets in relation to their context, such as by: 6.SP.5a: Reporting the number of observations. 6.SP.5b: Describing the nature of the attribute under investigation, including how it was measured and its units of measurements. 6.SP.5c: Summarize numerical data sets in relation to their context by 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 with reference to the context in which the data were given. 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.

Analysis of *California Mathematics* standards to *Common Core* standards
Algebra I

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
1.0 Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable:	7-Expressions and Equations 8-Expressions and Equations N-The Real Number System A-Arithmetic with Polynomials and Rational Expressions	7-NS.2b; Understand that integers can be divided, provided that the divisor is not zero, 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. 7-NS.2d; Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats 8-NS.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., $\pi 2$). N.RN.3; Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. A-APR.1; Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. A-APR.7; Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	Yes	
1.1 Students use properties of numbers to demonstrate whether assertions are true or false.			No	May be embedded in CCS Mathematical Practice Standards
2.0 Students understand and use such operations as taking the opposite, finding the reciprocal, taking a	8-Expressions and Equations N-The Real	8-EE.1; Know and apply the properties of integer exponents to generate equivalent numerical expressions.	Partial	Reciprocal is not specifically

	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	root, and raising to a fractional power. They understand and use the rules of exponents.	Number System A-Seeing Structure in Expressions	8-EE.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 $\sqrt{2}$ is irrational. N-RN.1; Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. N-RN.2; Rewrite expressions involving radicals and rational exponents using the properties of exponents. A-SSE.3c; Use the properties of exponents to transform expressions for exponential functions.		stated in CCS
3.0	Students solve equations and inequalities involving absolute values.			No	
4.0	Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12.$	8-Expressions and Equations	8-EE.7; Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	No	CCS covers this standard in 8th grade

5.0	Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.	7-Expressions and Equations 8-Expressions and Equations A-Reasoning with Equations and Inequalities A-Creating Equations	7-EE.4; Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
			   a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r,$ where $p, q,$ and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
			   b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r,$ where $p, q,$ and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.
			
			8-EE.7; Solve linear equations in one variable.
			   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).
				Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. A-CED.3; Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. A-REI.1; Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. A-REI.3; Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. A-REI.5; Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. A-REI.6; Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.		
6.0 Students graph a linear equation and compute the x- and y-intercepts (e.g., graph $2x + 6y = 4$). They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by $2x + 6y < 4$).	8-Expressions and Equations A-Reasoning with Equations and Inequalities F- Interpreting Functions	8.EE.5; Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. A-REI.10; Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). A-REI. 12; Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. F-IF.7a; Graph linear and quadratic functions and show intercepts, maxima, and minima.	Yes	

	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
7.0	Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula.			No	
8.0	Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.	G-Expressing Geometric Properties with Equations	G-GPE.5; Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	No	CCS covers this standard in Geometry
9.0	Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets.	8-Expressions and Equations A- Algebra- Creating Equations A-Reasoning with Equations and Inequalities	8-EE.8; Analyze and solve pairs of simultaneous linear equations. 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. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. c. Solve real-world and mathematical problems leading to two linear equations in two variables. A-CED.3; Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. A-REI.5; Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. A-REI.6; Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. A-REI 7; Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		A-REI 10; Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). A-REI.12; Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.		
10.0 Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques.	A-Arithmetic with Polynomials and Rational Expressions	A-APR 1; Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Yes	

11.0 Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.	A-Seeing Structure in Expressions
	A-Reasoning with Equations and Inequalities
		A-SSE.2; Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*
		
		A-SSE. 3; Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
		  a. Factor a quadratic expression to reveal the zeros of the function it defines.
		  b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
		
		A-REI.4b: Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.
			Partial	CCS does not specifically reference third-degree polynomials

12.0 Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms.	A-Arithmetic with Polynomials and Rational Expressions	A-APR. 6; Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	Yes	
13.0 Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually	A-Arithmetic with Polynomials and Rational Expressions	A-APR.7; Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
challenging problems by using these techniques.				
14.0 Students solve a quadratic equation by factoring or completing the square.	A-Reasoning with Equations and Inequalities F-Interpreting Functions	A-REI. 4; Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. F-IF. 8a; Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	Yes	
15.0 Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.			No	
16.0 Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.	8-Functions F-Interpreting Functions	8-F.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. 8-F.2; Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). 8-F.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. 8-F.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. F-IF.1; Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		F-IF.2; Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.		
17.0 Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression.	6-Expressions and Equations 8-Functions F-Interpreting Functions	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. 8-F.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. 8-F.2; Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). F-IF.1; Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. F-IF.2; Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. F-IF.5; Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	Yes	
18.0 Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion.	8-Functions F-Interpreting Functions	8-Cluster domain; Use functions to model relationships between quantities. 8-F.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. 8-F.2; Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). 8-F.5; Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. F-IF.1; Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. F-IF.2; Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. F-IF.5; Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		
19.0 Students know the quadratic formula and are familiar with its proof by completing the square.	A-Reasoning with Equations and Inequalities	A-REI.4a; Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 =$ q that has the same solutions. Derive the quadratic formula from this form**.	Yes	
20.0 Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.	A-Reasoning with Equations and Inequalities	A-REI.4b; Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	Yes	
21.0 Students graph quadratic functions and know that their roots are the x-intercepts.	A-Seeing Structure in Expressions F-Interpreting Functions	A-SSE.3a; Factor a quadratic expression to reveal the zeros of the function it defines. F-FI.7; Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		F-IF.8; Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.		
22.0 Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the *x*-axis in zero, one, or two points.	F-Interpreting Functions	F-IF.8; Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	Partial	Does not specifically state using the discriminant
23.0 Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.	A-Creating Equations	A-CED; 1. Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*	Partial	CCS does not specifically mention motion of an object under the force of gravity
24.0 Students use and know simple aspects of a logical argument:	Mathematical Practice	MP.3; Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
24.1 Students explain the difference between inductive and deductive reasoning and identify and provide examples of each.	Mathematical Practice	MP.3	Implied	CCS is not explicit regarding this standard
24.2 Students identify the hypothesis and conclusion in logical deduction.	Mathematical Practice	MP.3	Implied	CCS is not explicit regarding this standard
24.3 Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion.	Mathematical Practice	MP.3	No	
25.0 Students use properties of the number system to judge the validity of results, to justify each step of a procedure, and to prove or disprove statements:	Mathematical Practice	MP.3	Implied	CCS is not explicit regarding this standard
25.1 Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions.	Mathematical Practice	MP.3	No	
25.2 Students judge the validity of an argument according to whether the properties of the real number system and the order of operations have been applied correctly at each step.	Mathematical Practice	MP.3	Implied	CCS is not explicit regarding this standard
25.3 Given a specific algebraic statement involving linear, quadratic, or absolute value expressions or equations or inequalities, students determine whether the statement is true sometimes, always, or never.	Mathematical Practice	MP.3	No	

Analysis of *California Mathematics* standards to *Common Core* standards
Geometry

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
1.0 Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.	Mathematical Practice	MP.3; Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.	Partial	Not specifically referenced in CCS
2.0 Students write geometric proofs, including proofs by contradiction.	G-Congruence G-Similarity, Right Triangles and Trigonometry	G-CO.9; Prove theorems about lines and angles. G-CO.10; Prove theorems about triangles. G-CO.11; Prove theorems about parallelograms. G-SRT.4; Prove theorems about triangles. G-SRT.5; Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Partial	CCS does not specifically reference proofs by contradiction
3.0 Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.	Mathematical Practice	MP 3 MP4 MP5	Partial	Not specifically referenced in CCS

	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
4.0	Students prove basic theorems involving congruence and similarity.	8-Geometry G-Congruence G-Similarity, Right Triangles and Trigonometry	8-Cluster; Understand congruence and similarity using physical models, transparencies, or geometry software. G-CO.9; Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.* G-CO.10; Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.* G-CO.11; Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.* G-SRT. 4; Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.* G-SRT.5; Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Yes	
5.0	Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.	8-Geometry G-Congruence G-Similarity, Right Triangles and Trigonometry	8-Cluster; Understand congruence and similarity using physical models, transparencies, or geometry software. G.CO-7; Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. G.CO8; Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. G-SRT. 5; Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Yes	
6.0	Students know and are able to use the triangle inequality theorem.			No	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
7.0 Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.	G-Congruence G-Circles	G-CO.9; Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.* G-C.1; Prove that all circles are similar.	Partial	CCS does not specifically reference properties of circles or quadrilateral properties
8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.	G- Expressing Geometric Properties with Equations G-Geometry Measurement and Dimension	G-GPE.7; Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	Partial	CCS does not specifically reference derivation of perimeter etc.
9.0 Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders.	8-Geometry G-Geometry Measurement and Dimension	8-G.9; Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. G-MD.3; Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	Yes	
10.0 Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.	6-Geometry	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.	Partial	CCS does not specifically reference scalene
11.0 Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.			No	
12.0 Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.	8-Geometry G-Congruence	8-G.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. G-CO.9; Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on*	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.		
13.0 Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.	7-Geometry	7-G.5; Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	No	Covered in 7th grade
14.0 Students prove the Pythagorean theorem.	8-Geometry	8-G.6; Explain a proof of the Pythagorean Theorem and its converse.	No	Covered in 8th grade
15.0 Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.	8-Geometry	8-G.7; Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8-G.8; Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. | No | Covered in 8th grade |
| 16.0 Students perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line. | G-Congruence G-Circles | G-CO.12; Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*

G-CO.13; Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

G-C.3; Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

G-C.4; Construct a tangent line from a point outside a given circle to the circle. | Yes | |
| 17.0 Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles. | G-Expressing G-Geometric Properties with Equations | G-GPE.4; Use coordinates to prove simple geometric theorems algebraically.

G-GPE.7; Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula. | Partial | CCS does not specifically reference midpoint |

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
18.0 Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$.	G-Similarity, Right Triangles and Trigonometry F-Trigonometric Functions	G-SRT.6; Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. G-SRT.7; Explain and use the relationship between the sine and cosine of complementary angles. G-SRT.8; Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. F-TF.8; Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.	Partial	CCS does not specifically reference elementary trigonometric relationships
19.0 Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.	G-Similarity, Right Triangles and Trigonometry	G-SRT.7; Explain and use the relationship between the sine and cosine of complementary angles. G-SRT.8; Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	Yes	
20.0 Students know and are able to use angle and side relationships in problems with special right triangles, such as 30°, 60°, and 90° triangles and 45°, 45°, and 90° triangles.			No	
21.0 Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.	G-Circles	G-C.2; Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.* G-C.3; Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. G-C.4; Construct a tangent line from a point outside a given circle to the circle.	Partial	CCS does not specifically reference all the listed relationships
22.0 Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.	8-Geometry G- Congruence	8-G.1; Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		G-CO; Cluster Experiment with transformations in the plane. G-CO.2; Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). G-CO.3; Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. G-CO.4; Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. G-C0.5; Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. G-CO.6; Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.		

Analysis of *California Mathematics* standards to *Common Core* standards
Algebra II

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
1.0 Students solve equations and inequalities involving absolute value.			No	
2.0 Students solve systems of linear equations and inequalities (in two or three variables) by substitution, with graphs, or with matrices.	8-Equations and Expressions A-Reasoning with Equations and Inequalities	8-EE.8; Analyze and solve pairs of simultaneous linear equations. 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. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.* c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.* A-REI.5; Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. A-REI.6; Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. A-REI.7; Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. A-REI.8; Represent a system of linear equations as a single matrix equation in a vector variable. A-REI.9; Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3×3 or greater).	Partial	CCS does not specifically reference solving by substitution

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		A-REI.10; Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).		
		A-REI.11; Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.		
		A-REI.12; Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.		
3.0 Students are adept at operations on polynomials, including long division.	A- Arithmetic with Polynomials and Rational Expressions	A-APR.1; Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. A-APR.2; Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	Yes	
4.0 Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.	A- Seeing Structure in Expressions A-Reasoning with Equations and Inequalities	A-SEE.2; Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.* A-REI.4; Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	Partial	CCS does not specifically reference sum and difference of cubes

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
5.0 Students demonstrate knowledge of how real and complex numbers are related both arithmetically and graphically. In particular, they can plot complex numbers as points in the plane.	N-The Complex Number System	N-CN.1; Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real. N-CN.4; Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number. N-CN.5; Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation.	Yes	
6.0 Students add, subtract, multiply, and divide complex numbers.	N-The Complex Number System	N-CN.2; Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. N-CN.3; Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	Yes	
7.0 Students add, subtract, multiply, divide, reduce, and evaluate rational expressions with monomial and polynomial denominators and simplify complicated rational expressions, including those with negative exponents in the denominator.	A-Arithmetic with Polynomials and Rational Expressions	A-APR.6; Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system. A-APR.7; Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	Partial	CCS does not specifically reference negative exponents in the denominator

8.0 Students solve and graph quadratic equations by factoring, completing the square, or using the quadratic formula. Students apply these techniques in solving word problems. They also solve quadratic equations in the complex number system.	N-The Complex Number System
	
	A- Seeing Structure in Expressions
	
	A-Arithmetic with Polynomials and Rational Expressions
		N-CN.7; Solve quadratic equations with real coefficients that have complex solutions.
		
		A-SEE.3; Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
		  a. Factor a quadratic expression to reveal the zeros of the function it defines.
		  b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.		

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
	F-Interpreting Functions	A-REI.4; Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. F-FIF.7; Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima F-FIF.8; Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.		
9.0 Students demonstrate and explain the effect that changing a coefficient has on the graph of quadratic functions; that is, students can determine how the graph of a parabola changes as $a, b,$ and c vary in the equation $y = a(x-b)^2 + c$.			No	
10.0 Students graph quadratic functions and determine the maxima, minima, and zeros of the function.	F-Interpreting Functions	F-FIF.7; Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
11.0 Students prove simple laws of logarithms.			No	
11.1 Students understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	F-Building Functions	F-BF.5; Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	Yes	
11.2 Students judge the validity of an argument according to whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.			No	

12.0 Students know the laws of fractional exponents, understand exponential functions, and use these functions in problems involving exponential growth and decay.	A- Seeing Structure in Expressions
	
	F- Linear and Exponential Models
		A-SEE.3; Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
		   c. Use the properties of exponents to transform expressions for exponential functions.
		F-LE.1; Distinguish between situations that can be modeled with linear functions and with exponential functions.
		   a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
		   b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
		   c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
		
		N-RN.2; Rewrite expressions involving radicals and rational exponents using the properties of exponents.
			Yes	

13.0 Students use the definition of logarithms to translate between logarithms in any base.			No	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
14.0 Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and to identify their approximate values.			No	
15.0 Students determine whether a specific algebraic statement involving rational expressions, radical expressions, or logarithmic or exponential functions is sometimes true, always true, or never true.			No	
16.0 Students demonstrate and explain how the geometry of the graph of a conic section (e.g., asymptotes, foci, eccentricity) depends on the coefficients of the quadratic equation representing it.			No	
17.0 Given a quadratic equation of the form $ax^2 + by^2 + cx + dy + e = 0$, students can use the method for completing the square to put the equation into standard form and can recognize whether the graph of the equation is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.			No	
18.0 Students use fundamental counting principles to compute combinations and permutations.			No	
19.0 Students use combinations and permutations to compute probabilities.	S-Conditional Probability and the Rules of Probability	S-CP.9; Use permutations and combinations to compute probabilities of compound events and solve problems.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
20.0 Students know the binomial theorem and use it to expand binomial expressions that are raised to positive integer powers.	A-Arithmetic with Polynomials and Rational Expressions	A-APR.5; Know and apply the Binomial Theorem for the expansion of $(x + y)n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal'sTriangle.	Yes	
21.0 Students apply the method of mathematical induction to prove general statements about the positive integers.			No	
22.0 Students find the general term and the sums of arithmetic series and of both finite and infinite geometric series.	A- Seeing Structure in Expressions	A-SEE.4; Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.	Partial	CCS does not specifically reference arithmetic series
23.0 Students derive the summation formulas for arithmetic series and for both finite and infinite geometric series.	A- Seeing Structure in Expressions	A-SEE.4; Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.	Partial	CCS does not specifically reference arithmetic series

24.0 Students solve problems involving functional concepts, such as composition, defining the inverse function and performing arithmetic operations on functions.	F-Building Functions	F-BF.3; Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*
		
		F-BF.4; Find inverse functions.
		  a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse.
		  b. Verify by composition that one function is the inverse of another.
		  c. Read values of an inverse function from a graph or a table, given that the function has an inverse.
		  d. Produce an invertible function from a non-invertible function by restricting the domain.
			Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
		F-BF.5; Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.		
25.0 Students use properties from number systems to justify steps in combining and simplifying functions.	A-Arithmetic with Polynomials and Rational	A-APR.1; Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Yes	

Analysis of *California Mathematics* standards to *Common Core* standards
Trigonometry

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
1.0 Students understand the notion of angle and how to measure it, in both degrees and radians. They can convert between degrees and radians.	F-Trigonometric Functions	F-TF.1; Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	Partial	CSS does not specify converting between degrees and radians
2.0 Students know the definition of sine and cosine as y-and x-coordinates of points on the unit circle and are familiar with the graphs of the sine and cosine functions.	F-Trigonometric Functions	F-TF.2; Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.

F-TF.3; Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosines, and tangent for x, $\pi+x$, and $2\pi-x$ in terms of their values for x, where x is any real number. | Partial | CSS does not specify graphs of sine and cosine functions |
3.0 Students know the identity $\cos^2(x) + \sin^2(x) = 1$:	F-Trigonometric Functions	F-TF.8; Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.	Yes	
3.1 Students prove that this identity is equivalent to the Pythagorean theorem (i.e., students can prove this identity by using the Pythagorean theorem and, conversely, they can prove the Pythagorean theorem as a consequence of this identity).	F-Trigonometric Functions	F-TF.8; Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.	Yes	
3.2 Students prove other trigonometric identities and simplify others by using the identity $\cos^2(x) + \sin^2(x) = 1$. For example, students use this identity to prove that $\sec^2(x) = \tan^2(x) + 1$.	F-Trigonometric Functions	F-TF.9; Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
4.0 Students graph functions of the form $f(t) = A \sin (Bt + C)$ or $f(t) = A \cos (Bt + C)$ and interpret A, B, and C in terms of amplitude, frequency, period, and phase shift.	F-Trigonometric Functions	F-TF.5; Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.		
5.0 Students know the definitions of the tangent and cotangent functions and can graph them.			No	
6.0 Students know the definitions of the secant and cosecant functions and can graph them.			No	
7.0 Students know that the tangent of the angle that a line makes with the x-axis is equal to the slope of the line.			No	
8.0 Students know the definitions of the inverse trigonometric functions and can graph the functions.			No	
9.0 Students compute, by hand, the values of the trigonometric functions and the inverse trigonometric functions at various standard points.			No	
10.0 Students demonstrate an understanding of the addition formulas for sines and cosines and their proofs and can use those formulas to prove and/or simplify other trigonometric identities.	F-Trigonometric Functions	F-TF.9; Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	Yes	
11.0 Students demonstrate an understanding of half-angle and double-angle formulas for sines and cosines and can use those formulas to prove and/or simplify other trigonometric identities.			No	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in reference to CCS
12.0 Students use trigonometry to determine unknown sides or angles in right triangles.	G- Similarity, Right Triangles, and Trigonometry	G-SRT.8; Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. G-SRT.11; Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	Yes	
13.0 Students know the law of sines and the law of cosines and apply those laws to solve problems.	G- Similarity, Right Triangles, and Trigonometry	G-SRT.11; Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	Yes	
14.0 Students determine the area of a triangle, given one angle and the two adjacent sides.			No	
15.0 Students are familiar with polar coordinates. In particular, they can determine polar coordinates of a point given in rectangular coordinates and vice versa.		N-CN.4; Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	Partial	
16.0 Students represent equations given in rectangular coordinates in terms of polar coordinates.			No	
17.0 Students are familiar with complex numbers. They can represent a complex number in polar form and know how to multiply complex numbers in their polar form.	N-Complex Number	N-CN.4; Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	Partial	CSS does not specify multiplying complex numbers in their polar form
18.0 Students know DeMoivre's theorem and can give nth roots of a complex number given in polar form.			No	
19.0 Students are adept at using trigonometry in a variety of applications and word problems.	FTF	F-TF.9; Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	Partial	

Analysis of *California Mathematics* standards to *Common Core* standards
Mathematical Analysis

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
1.0 Students are familiar with, and can apply, polar coordinates and vectors in the plane. In particular, they can translate between polar and rectangular coordinates and can interpret polar coordinates and vectors graphically.	The Complex Number System	N-CN.4; Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	Partial	CCS does not reference interpret polar coordinates and vectors graphically.
2.0 Students are adept at the arithmetic of complex numbers. They can use the trigonometric form of complex numbers and understand that a function of a complex variable can be viewed as a function of two real variables. They know the proof of DeMoivre's theorem.	The Complex Number System	N-CN.2; Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. N-CN. 5; Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. *For example, $(-1 + \sqrt{3}i)^3 = 8$ because $(-1 + \sqrt{3}i)$ has modulus 2 and argument 120°.* N-CN.9; Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	Partial	CCS does not specifically reference the proof of DeMoivre's theorem.
3.0 Students can give proofs of various formulas by using the technique of mathematical induction.			No	
4.0 Students know the statement of, and can apply, the fundamental theorem of algebra.	The Complex Number System	N-CN.9; Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
5.0 Students are familiar with conic sections, both analytically and geometrically:	Expressing Geometric Properties with Equations	G-GPE (Cluster statement); Translate between the geometric description and the equation for a conic section. G-GPE.1; Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. G-GPE.2; Derive the equation of a parabola given a focus and directrix. G-GPE.3; Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.	Yes	
5.1 Students can take a quadratic equation in two variables; put it in standard form by completing the square and using rotations and translations, if necessary; determine what type of conic section the equation represents; and determine its geometric components (foci, asymptotes, and so forth).	Expressing Geometric Properties with Equations	G-GPE.1; Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. G-GPE.2; Derive the equation of a parabola given a focus and directrix. G-GPE.3; Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.	Yes	
5.2 Students can take a geometric description of a conic section—for example, the locus of points whose sum of its distances from (1, 0) and (-	Expressing Geometric Properties with Equations	G-GPE.1; Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
1, 0) is 6—and derive a quadratic equation representing it.		center and radius of a circle given by an equation. G-GPE.2; Derive the equation of a parabola given a focus and directrix. G-GPE.3; Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.		
6.0 Students find the roots and poles of a rational function and can graph the function and locate its asymptotes.	Interpreting Functions	F-IF.7d; Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.	Yes	
7.0 Students demonstrate an understanding of functions and equations defined parametrically and can graph them.			No	
8.0 Students are familiar with the notion of the limit of a sequence and the limit of a function as the independent variable approaches a number or infinity. They determine whether certain sequences converge or diverge.	Interpreting Functions Building Functions	F-IF.7c; Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. F-IF.7e; Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. F-BF.2; Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★	Partial	CCS does not specifically reference if infinite sequences converge or diverge.

Analysis of *California Mathematics* standards to *Common Core* standards
Linear Algebra

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
1.0 Students solve linear equations in any number of variables by using Gauss-Jordan elimination.	Reasoning with Equations and Inequalities	A-REI.8; Represent a system of linear equations as a single matrix equation in a vector variable. A-REI.9; Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	Yes	
2.0 Students interpret linear systems as coefficient matrices and the Gauss-Jordan method as row operations on the coefficient matrix.	Reasoning with Equations and Inequalities	A-REI.8; Represent a system of linear equations as a single matrix equation in a vector variable. A-REI.9; Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	Yes	
3.0 Students reduce rectangular matrices to row echelon form.	Reasoning with Equations and Inequalities	A-REI.9; Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	Partial	CCS does not specifically reference reducing matrices to row echelon form.
4.0 Students perform addition on matrices and vectors.	Vector and Matrix Quantities	N-VM.8; Add, subtract, and multiply matrices of appropriate dimensions.	Yes	
5.0 Students perform matrix multiplication and multiply vectors by matrices and by scalars.	Vector and Matrix Quantities	N-VM.4c; Understand vector subtraction $v - w$ as $v + (-w)$, where $-w$ is the additive inverse of w, with the same magnitude as w and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
		N-VM.5b; Compute the magnitude of a scalar multiple $c\mathbf{v}$ using $\|c\mathbf{v}\| = |c|v$. Compute the direction of $c\mathbf{v}$ knowing that when $|c|v \neq 0$, the direction of $c\mathbf{v}$ is either along $\mathbf{v}$ (for $c > 0$) or against $\mathbf{v}$ (for $c < 0$). N-VM.7; Multiply matrices by scalars to produce new matrices; e.g., as when all of the payoffs in a game are doubled.		
6.0 Students demonstrate an understanding that linear systems are inconsistent (have no solutions), have exactly one solution, or have infinitely many solutions.	Reasoning with Equations and Inequalities	A-REI.9; Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3×3 or greater).	Partial (possibly implied)	CCS does not specifically reference the understanding of no solutions, one solution, or infinitely many solutions.
7.0 Students demonstrate an understanding of the geometric interpretation of vectors and vector addition (by means of parallelograms) in the plane and in three-dimensional space.	Vector and Matrix Quantities	N-VM.4; Add and subtract vectors. N-VM.4a; Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.	Yes	
8.0 Students interpret geometrically the solution sets of systems of equations. For example, the solution set of a single linear equation in two variables is interpreted as a line in the plane, and the solution set of a two-by-two system is interpreted as the intersection of a pair of lines in the plane.	Reasoning with Equations and Inequalities	A-REI.6; Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	Yes	
9.0 Students demonstrate an understanding of the notion of the inverse to a square matrix and apply that concept to solve systems of linear equations.	Reasoning with Equations and Inequalities	A-REI.9; Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3×3 or greater).	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
10.0 Students compute the determinants of 2 × 2 and 3 × 3 matrices and are familiar with their geometric interpretations as the area and volume of the parallelepipeds spanned by the images under the matrices of the standard basis vectors in two-dimensional and three-dimensional spaces.	Vector and Matrix Quantities	N-VM.12; Work with 2 × 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.	Partial	CCS does not specifically reference 3x3 matrices and volume.
11.0 Students know that a square matrix is invertible if, and only if, its determinant is nonzero. They can compute the inverse to 2 × 2 and 3 × 3 matrices using row reduction methods or Cramer's rule.	Vector and Matrix Quantities	N-VM.10; Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	Partial	CCS does not specifically reference Cramer's Rule.
12.0 Students compute the scalar (dot) product of two vectors in *n*-dimensional space and know that perpendicular vectors have zero dot product.	Vector and Matrix Quantities	N-VM.5; Multiply a vector by a scalar. N-VM.5a; Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise; e.g., as c(vx, vy) = (cvx, cvy). N-VM.5b; Compute the magnitude of a scalar multiple cv using $\|cv\| = |c|v$. Compute the direction of cv knowing that when $|c|v \neq 0$, the direction of cv is either along v (for c > 0) or against v (for c < 0).	Partial	CCS does not specifically reference perpendicular vectors with zero dot product.

Analysis of *California Mathematics* standards to *Common Core* standards
Probability and Statistics

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
1.0 Students know the definition of the notion of *independent events* and can use the rules for addition, multiplication, and complementation to solve for probabilities of particular events in finite sample spaces.	Conditional Probability and the Rules of Probability	S-CP.1; Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). S-CP.2; Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent. S-CP.7; Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model. S-CP.8; Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B|A) = P(B)P(A|B)$, and interpret the answer in terms of the model.	Yes	
2.0 Students know the definition of *conditional probability* and use it to solve for probabilities in finite sample spaces.	Conditional Probability and the Rules of Probability	S-CP.3; Understand the conditional probability of *A* given *B* as $P(A \text{ and } B)/P(B)$, and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
		S-CP.5; Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. *For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*		
3.0 Students demonstrate an understanding of the notion of *discrete random variables* by using them to solve for the probabilities of outcomes, such as the probability of the occurrence of five heads in 14 coin tosses.	Making Inferences and Justifying Conclusions	S-IC.2; Decide if a specified model is consistent with results from a given data-generating process; e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*	Yes	
	Using Probability to Make Decisions	S-MD.1; Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions. S-MD.2; Calculate the expected value of a random variable; interpret it as the mean of the probability distribution. S-MD.3; Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. *For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find*		

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
		the expected grade under various grading schemes. S-MD.4; (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. *For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?*		
4.0 Students are familiar with the standard distributions (normal, binomial, and exponential) and can use them to solve for events in problems in which the distribution belongs to those families.	Interpreting Categorical and Quantitative Data	S-ID.6; Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. S-ID.6a; Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Uses given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*	Yes	
5.0 Students determine the mean and the standard deviation of a normally distributed random variable.	6th Statistics, Data Analysis, and Probability	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.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
6.0 Students know the definitions of the *mean, median,* and *mode* of a distribution of data and can compute each in particular situations.	6th Statistics, Data Analysis, and Probability Interpreting Categorical and Quantitative Data	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. 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. S-ID.2; Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	Partial	CCS does not reference computation of mode for qualitative data.
7.0 Students compute the variance and the standard deviation of a distribution of data.	6th Statistics, Data Analysis, and Probability	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	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	Interpreting Categorical and Quantitative Data	the shape of the data distribution and the context in which the data were gathered. S-ID.2; Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.		
8.0 Students organize and describe distributions of data by using a number of different methods, including frequency tables, histograms, standard line and bar graphs, stem-and-leaf displays, scatterplots, and box-and-whisker plots.	6th Statistics, Data Analysis, and Probability Interpreting Categorical and Quantitative Data	6.SP.4; Display numerical data in plots on a number line, including dot plots, histograms, and box plots. S-ID.1; Represent data with plots on the real number line (dot plots, histograms, and box plots). S-ID.5; Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. S-ID.6; Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	Yes	
	Conditional Probability and the Rules of Probability	S-CP.4; Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of*		

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
		students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.		

Analysis of *California Mathematics* standards to *Common Core* standards
Advanced Placement Probability and Statistics

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
1.0 Students solve probability problems with finite sample spaces by using the rules for addition, multiplication, and complementation for probability distributions and understand the simplifications that arise with independent events.	Conditional Probability and the Rules of Probability	S-CP.1; Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). S-CP.2; Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent. S-CP.7; Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. S-CP.8; Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model.	Yes	
2.0 Students know the definition of *conditional probability* and use it to solve for probabilities in finite sample spaces.	Conditional Probability and the Rules of Probability	S-CP.3; Understand the conditional probability of *A* given *B* as P(A and B)/P(B), and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
		S-CP.5; Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. *For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*		
3.0 Students demonstrate an understanding of the notion of *discrete random variables* by using this concept to solve for the probabilities of outcomes, such as the probability of the occurrence of five or fewer heads in 14 coin tosses.	7th Statistics, Data Analysis, and Probability	7-SP.6; Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	Yes	
	Making Inferences and Justifying Conclusions	S-IC.1; Understand statistics as a process for making inferences about population parameters based on a random sample from that population.		
		S-IC.2; Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*		
	Using Probability to Make Decisions	S-MD.1; Define a random variable for a quantity of interest by assigning a numerical value to		

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
		each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions. S-MD.2; Calculate the expected value of a random variable; interpret it as the mean of the probability distribution. S-MD.3; Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. *For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.* S-MD.4; Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. *For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?*		

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
4.0 Students understand the notion of a *continuous random variable* and can interpret the probability of an outcome as the area of a region under the graph of the probability density function associated with the random variable.	Using Probability to Make Decisions	S-MD.1; Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions. S-MD.2; Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.	Yes	
5.0 Students know the definition of the *mean of a discrete random variable* and can determine the mean for a particular discrete random variable.	Using Probability to Make Decisions	S-MD.2; Calculate the expected value of a random variable; interpret it as the mean of the probability distribution. S-MD.3; Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. *For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.* S-MD.4; Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. *For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the*	Yes	

	CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
			expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?		
6.0	Students know the definition of the *variance of a discrete random variable* and can determine the variance for a particular discrete random variable.	6th Statistics, Data Analysis, and Probability	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. 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.	Yes	
7.0	Students demonstrate an understanding of the standard distributions (normal, binomial, and exponential) and can use the distributions to solve for events in problems in which the distribution belongs to those families.	Using Probability to Make Decisions	S-MD.3; Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. *For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.*	Partial	CCS does not explicitly reference normal, binomial, and exponential distributions.
8.0	Students determine the mean and the standard deviation of a normally distributed random variable.	Using Probability to Make Decisions	S-MD.3; Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. *For example, find the theoretical probability distribution*	Partial	CCS does not explicitly reference normal distributions.

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
		for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.		
9.0 Students know the central limit theorem and can use it to obtain approximations for probabilities in problems of finite sample spaces in which the probabilities are distributed binomially.	Making Inferences and Justifying Conclusions	S-IC.1; Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	Yes	
10.0 Students know the definitions of the *mean, median,* and *mode of distribution* of data and can compute each of them in particular situations.	6th Statistics, Data Analysis, and Probability	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. 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.	Partial	CCS does not reference computation of mode for qualitative data.
	Interpreting Categorical and Quantitative Data	S-ID.2; Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.		

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
11.0 Students compute the variance and the standard deviation of a distribution of data.	Interpreting Categorical and Quantitative Data	S-ID.2; Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. S-ID.4; Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	Yes	
12.0 Students find the line of best fit to a given distribution of data by using least squares regression.	Interpreting Categorical and Quantitative Data	S-ID.1; Represent data with plots on the real number line (dot plots, histograms, and box plots). S-ID.6; Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. S-ID.6a; Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.* S-ID.6b; Informally assess the fit of a function by plotting and analyzing residuals. S-ID.6c; Fit a linear function for a scatter plot that suggests a linear association.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
		S-ID.7; Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. S-ID.8; Compute (using technology) and interpret the correlation coefficient of a linear fit.		
13.0 Students know what the *correlation coefficient of two variables* means and are familiar with the coefficient's properties.	Interpreting Categorical and Quantitative Data	S-ID.8; Compute (using technology) and interpret the correlation coefficient of a linear fit. S-ID.9; Distinguish between correlation and causation.	Yes	
14.0 Students organize and describe distributions of data by using a number of different methods, including frequency tables, histograms, standard line graphs and bar graphs, stem-and-leaf displays, scatterplots, and box-and-whisker plots.	6th Statistics, Data Analysis, and Probability Interpreting Categorical and Quantitative Data	6.SP.4; Display numerical data in plots on a number line, including dot plots, histograms, and box plots. S-ID.1; Represent data with plots on the real number line (dot plots, histograms, and box plots). S-ID.5; Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. S-ID.6; Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
	Conditional Probability and the Rules of Probability	S-CP.1; Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). S-CP.4; Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*		
15.0 Students are familiar with the notions of a statistic of a distribution of values, of the sampling distribution of a statistic, and of the variability of a statistic.	Making Inferences and Justifying Conclusions	S-IC.1; Understand statistics as a process for making inferences about population parameters based on a random sample from that population. S-IC.2; Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*	Yes	

CA Math Standard	Domain	Common Core Standard (CCS)	Alignment	Comments in Reference to CCS
16.0 Students know basic facts concerning the relation between the mean and the standard deviation of a sampling distribution and the mean and the standard deviation of the population distribution.	Making Inferences and Justifying Conclusions	S-IC.2; Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?* S-IC.4; Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	Yes	
17.0 Students determine confidence intervals for a simple random sample from a normal distribution of data and determine the sample size required for a desired margin of error.	Making Inferences and Justifying Conclusions	S-IC.4; Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	Yes	
18.0 Students determine the *P*-value for a statistic for a simple random sample from a normal distribution.			No	
19.0 Students are familiar with the *chi*-square distribution and *chi*-square test and understand their uses.			No	

Mathematics Crosswalk Summary Charts

California Algebra Standards Not Covered in Common Core

Algebra California Standards	Comments
1.1 Students use properties of numbers to demonstrate whether assertions are true or false.	
3.0 Students solve equations and inequalities involving absolute values.	
4.0 Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x\text{-}5) + 4(x\text{-}2) = 12$.	Covered in 8th grade CCS
7.0 Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula.	
8.0 Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.	CCS covers this standard in Geometry
11.0 Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.	Partial
15.0 Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.	
22.0 Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points.	Partial
23.0 Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.	Partial
24.3 Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion.	
25.1 Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions.	
25.3 Given a specific algebraic statement involving linear, quadratic, or absolute value expressions or equations or inequalities, students determine whether the statement is true sometimes, always, or never.	

High School Algebra Core Standards Not Matched to California Standards

Common Core Standards High School Algebra	Comments
A-SEE.1; Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret P*(1+*r*)n *as the product of P and a factor not depending on P.*	
A-SEE.4; Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.*	Algebra 2
A-APR.2; Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	Algebra 2
A-APR.3; Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	
A-APR.4; Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity* $(x^2 + y^2)^2 = (x^2 - y^2)2 + (2xy)^2$ *can be used to generate Pythagorean triples.*	
A-APR.5; Know and apply the Binomial Theorem for the expansion of $(x + y)$n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.	Algebra 2
A-CED 2; Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	
A-CED 4; Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*	
A-REI. 2; Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	
A-REI. 8; Represent a system of linear equations as a single matrix equation n a vector variable.	Algebra 2
A-REI.9; Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	Algebra 2
A-REI; Explain why the x-coordinates of the points where the graphs of he equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	Algebra 2

Algebra Crosswalk Core Standards Referenced

6th	7th	8th	Core	Comments
6.EE.9	7-NS.2b, d 7-EE.4a, 4b	8-NS.2 8-EE.1, 2, 5, 7, 8a-c 8-F.1, 2, 4, 5	N.RN. 1, 2, 3 A-SEE. 2, 3a, 3b A-APR. 1, 6, 7 A-CED. 1, 3 A-REI. 1, 3, 4a, 4b, 5, 6, 7, 10, 12 F-IF. 1, 2, 5, 7a-e, 8a G-GPE.5	Consider adding A-SSE.1a, 1b F-IF.4 F.BF.1a-c F.LE.1a-c

California Geometry Standards Not Covered in Common Core

Geometry California Standards	Comments
1.0 Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.	Partial
2.0 Students write geometric proofs, including proofs by contradiction.	Partial
3.0 Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.	Partial
6.0 Students know and are able to use the triangle inequality theorem.	
7.0 Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.	Partial
8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.	Partial
10.0 Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.	Partial
11.0 Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.	
13.0 Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.	Covered in 7th grade CCS
14.0 Students prove the Pythagorean theorem.	Covered in 8th grade CCS
15.0 Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.	Covered in 8th grade CCS
17.0 Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles.	Partial
18.0 Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$.	Partial
20.0 Students know and are able to use angle and side relationships in problems with special right triangles, such as 30°, 60°, and 90° triangles and 45°, 45°, and 90° triangles.	
21.0 Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.	Partial

High School Geometry Core Standards Not Matched to California Standards

Common Core Standards High School Geometry	Comments
G-GCO.13; Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	
G-SRT.1; Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	
G-SRT.2; Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	
G-SRT. 9; Derive the formula $A = 1/2\ ab$ sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	
G-SRT. 10; Prove the Laws of Sines and Cosines and use them to solve problems.	Math Analysis
G-SRT. 11; Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	
G-SRT.3; Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	
G-C.5; Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	
G-GPE.1; Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	Math Analysis
G-GPE.2; Derive the equation of a parabola given a focus and directrix.	Math Analysis
G-GPE.3; Derive the equations of ellipses and hyperbolas given foci and directrices.	Math Analysis
G-GPE.5; Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	
G-GPE.6; Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	
G-GMD.1; Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*	
G-GMD.2; Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	
G-GMD. 4; Identify the shapes of two-dimensional cross-sections of three dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	
G-MG.1; Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	
G-MG .2.; Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	
G-MG .3; Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	

Geometry Crosswalk Core Standards Referenced

6th	7th	8th	Core	Comments
6-G.1	7-G.5	8-G.5, 6, 7, 8, 9	G-CO.2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13 G-SRT.4, 5, 6, 7, 8 G-C.1, 2, 3, 4 G-GPE.4, 7 G.MD 3 F.TF.8	Consider adding language for partial coverage of CA standards

California Algebra II Standards Not Covered in Common Core

Algebra II California Standards	Comments
1.0 Students solve equations and inequalities involving absolute value.	
2.0 Students solve systems of linear equations and inequalities (in two or three variables) by substitution, with graphs, or with matrices.	Partial
4.0 Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.	Partial
7.0 Students add, subtract, multiply, divide, reduce, and evaluate rational expressions with monomial and polynomial denominators and simplify complicated rational expressions, including those with negative exponents in the denominator.	Partial
9.0 Students demonstrate and explain the effect that changing a coefficient has on the graph of quadratic functions; that is, students can determine how the graph of a parabola changes as *a, b,* and *c* vary in the equation $y = a(x\text{-}b)^2 + c$.	
11.0 Students prove simple laws of logarithms.	
11.2 Students judge the validity of an argument according to whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.	
13.0 Students use the definition of logarithms to translate between logarithms in any base.	
14.0 Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and to identify their approximate values.	
15.0 Students determine whether a specific algebraic statement involving rational expressions, radical expressions, or logarithmic or exponential functions is sometimes true, always true, or never true.	
16.0 Students demonstrate and explain how the geometry of the graph of a conic section (e.g., asymptotes, foci, eccentricity) depends on the coefficients of the quadratic equation representing it.	
17.0 Given a quadratic equation of the form $ax^2 + by^2 + cx + dy + e = 0$, students can use the method for completing the square to put the equation into standard form and can recognize whether the graph of the equation is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.	
18.0 Students use fundamental counting principles to compute combinations and permutations.	
21.0 Students apply the method of mathematical induction to prove general statements about the positive integers.	
22.0 Students find the general term and the sums of arithmetic series and of both finite and infinite geometric series.	Partial
23.0 Students derive the summation formulas for arithmetic series and for both finite and infinite geometric series.	Partial

Algebra II Crosswalk Core Standards Referenced

6th	7th	8th	Core	Comments
None	None	8-EE.8a-c	N-CN.1, 2, 3, 4, 5, 7 A-SEE.2, 3a-c, 4 A-APR.1, 2, 5, 6, 7 A-REI.4a-b, 5, 6, 7, 8, 9, 11, 12 F-IF.7, 8 F-BF.3, 4, 5 F-LE.1a-c S.CP.9	Consider adding N-CN.8, 9 A-APR.3, 4 A-REI.1, 2 F-IF.4, 5, 6 Trigonometric functions F.TF

California Trigonometry Standards Not Covered in Common Core

Trigonometry California Standards	Comments
1.0 Students understand the notion of angle and how to measure it, in both degrees and radians. They can convert between degrees and radians.	
2.0 Students know the definition of sine and cosine as y-and x-coordinates of points on the unit circle and are familiar with the graphs of the sine and cosine functions.	
5.0 Students know the definitions of the tangent and cotangent functions and can graph them.	
6.0 Students know the definitions of the secant and cosecant functions and can graph them.	
7.0 Students know that the tangent of the angle that a line makes with the x-axis is equal to the slope of the line.	
8.0 Students know the definitions of the inverse trigonometric functions and can graph the functions.	
9.0 Students compute, by hand, the values of the trigonometric functions and the inverse trigonometric functions at various standard points.	
11.0 Students demonstrate an understanding of half-angle and double-angle formulas for sines and cosines and can use those formulas to prove and/or simplify other trigonometric identities.	
14.0 Students determine the area of a triangle, given one angle and the two adjacent sides.	
15.0 Students are familiar with polar coordinates. In particular, they can determine polar coordinates of a point given in rectangular coordinates and vice versa.	Partial
16.0 Students represent equations given in rectangular coordinates in terms of polar coordinates.	
17.0 Students are familiar with complex numbers. They can represent a complex number in polar form and know how to multiply complex numbers in their polar form.	Partial
18.0 Students know DeMoivre's theorem and can give nth roots of a complex number given in polar form.	
19.0 Students are adept at using trigonometry in a variety of applications and word problems.	Partial

Trigonometry Crosswalk Core Standards Referenced

6th	7th	8th	Core	Comments
None	None	None	N-CN.4 G-SRT.8. 11 T-TE.1, 2, 3, 5, 8, 9	

California Mathematical Analysis Standards Not Covered in Common Core

Mathematical Analysis California Standards	Comments
1.0 Students are familiar with, and can apply, polar coordinates and vectors in the plane. In particular, they can translate between polar and rectangular coordinates and can interpret polar coordinates and vectors graphically.	Partial N-CN 4
2.0 Students are adept at the arithmetic of complex numbers. They can use the trigonometric form of complex numbers and understand that a function of a complex variable can be viewed as a function of two real variables. They know the proof of DeMoivre's theorem.	Partial N-CN 2,5,9
3.0 Students can give proofs of various formulas by using the technique of mathematical induction.	
7.0 Students demonstrate an understanding of functions and equations defined parametrically and can graph them.	
8.0 Students are familiar with the notion of the limit of a sequence and the limit of a function as the independent variable approaches a number or infinity. They determine whether certain sequences converge or diverge.	Partial F-IF 7; F-BF 2

Mathematical Analysis Crosswalk Core Standards Referenced

6th	7th	8th	Core	Comments
			N-CN 2,4,5,9 F-IF 7 F-BF 2 G-GPE 1,2,3	

California Linear Algebra Standards Not Covered in Common Core

California Linear Algebra Standards	Comments
3.0 Students reduce rectangular matrices to row echelon form.	Partial A-REI.9
6.0 Students demonstrate an understanding that linear systems are inconsistent (have no solutions), have exactly one solution, or have infinitely many solutions.	Possibly implied in A-REI.9
10.0 Students compute the determinants of 2×2 and 3×3 matrices and are familiar with their geometric interpretations as the area and volume of the parallelepipeds spanned by the images under the matrices of the standard basis vectors in two-dimensional and three-dimensional spaces.	Partial in N-VM.12
11.0 Students know that a square matrix is invertible if, and only if, its determinant is nonzero. They can compute the inverse to 2×2 and 3×3 matrices using row reduction methods or Cramer's rule.	Partial in N-VM.10
12.0 Students compute the scalar (dot) product of two vectors in n-dimensional space and know that perpendicular vectors have zero dot product.	Partial in N-VM.5

Linear Algebra Crosswalk Core Standards Referenced

6th	7th	8th	Core	Comments
			A-REI.6 A-REI.8 A-REI.9 N-VM.4,5,6,7,8,10,12	

California Probability and Statistics Standards Not Covered in Common Core

California Probability and Statistics Standards	Comments
6.0 Students know the definitions of the *mean, median,* and *mode* of a distribution of data and can compute each in particular situations.	Partial 6-SP.3,5; S-ID.2

Probability and Statistics Core Standards Not Matched to California Standards

Common Core Standards Probability and Statistics	Comments
S-ID.3; Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	Partial 6th SDAP 1.3
S-ID.4; Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	Partial Advanced Placement Probability and Statistics 11.0
S-ID.7; Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Yes Advanced Placement Probability and Statistics 12.0
S-ID.8; Compute (using technology) and interpret the correlation coefficient of a linear fit.	Yes Advanced Placement Probability and Statistics 12.0, 13.0
S-ID.9; Distinguish between correlation and causation.	Partial Advanced Placement Probability and Statistics 13.0
S-IC.1; Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	Yes Advanced Placement Probability and Statistics 3.0,9.0,14.0,15.0

S-IC.3; Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	Partial 6th SDAP 2.2, 2.3
S-IC.4; Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	Partial Advanced Placement Probability and Statistics 16.0
S-IC.5; Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	No
S-IC.6; Evaluate reports based on data.	No
S-CP.6; Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A*, and interpret the answer in terms of the model.	No
S-CP.9; (+) Use permutations and combinations to compute probabilities of compound events and solve problems.	Partial Algebra II 18.0, 19.0
S-MD.5; (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.	No
S-MD.5a; Find the expected payoff for a game of chance. *For example, find the expected winnings from a state lottery ticket or a game at a fastfood restaurant.*	No
S-MD.5b; Evaluate and compare strategies on the basis of expected values. *For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.*	No
S-MD.6; (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	No
S-MD.7; (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	No

Probability and Statistics Crosswalk Core Standards Referenced

6th	7th	8th	Core	Comments
SDAP-3,4,5			S-ID 1,2,5,6 S-IC 2 S-CP 1,2,3,4,5,7,8 S-MD 1,2,3,4	

California Advanced Placement Probability and Statistics Standards Not Covered in Common Core

California Advanced Placement Probability and Statistics Standards	Comments
7.0 Students demonstrate an understanding of the standard distributions (normal, binomial, and exponential) and can use the distributions to solve for events in problems in which the distribution belongs to those families.	Partial S-MD.3
8.0 Students determine the mean and the standard deviation of a normally distributed random variable.	Partial S-MD.3
10.0 Students know the definitions of the *mean, median,* and *mode of distribution* of data and can compute each of them in particular situations.	Partial 6-SP.3,5; S-ID.2
18.0 Students determine the *P*-value for a statistic for a simple random sample from a normal distribution.	
19.0 Students are familiar with the *chi*-square distribution and *chi*-square test and understand their uses.	

Advanced Placement Probability and Statistics Core Standards Not Matched to California Standards

Common Core Standards Advanced Placement Probability and Statistics	Comments
S-ID.3; Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	Partial 6th SDAP 1.3
S-IC.3; Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	Partial 6th SDAP 2.2, 2.3
S-IC.5; Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	No
S-IC.6; Evaluate reports based on data.	No
S-CP.6; Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A,* and interpret the answer in terms of the model.	No
S-CP.9; (+) Use permutations and combinations to compute probabilities of compound events and solve problems.	Partial Algebra II 18.0, 19.0
S-MD.5; (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.	No
S-MD.5a; Find the expected payoff for a game of chance. *For example, find the expected winnings from a state lottery ticket or a game at a fastfood restaurant.*	No
S-MD.5b; Evaluate and compare strategies on the basis of expected values. *For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.*	No
S-MD.6; (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	No
S-MD.7; (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	No

Advanced Placement Probability and Statistics Crosswalk Core Standards Referenced

6th	7th	8th	Core	Comments
SDAP 3,4,5	SDAP 6		S-ID 1,2,4,5,6,7,8,9 S-IC 1,2,4 S-CP 1,2,3,4,5,7,8 S-MD 1,2,3,4	