Notes

The California Academic Content Standards Commission is considering adopting the national Common Core standards in place of the state's existing standards and at the same time also modestly augmenting the Common Core standards in order to maintain the rigor of California's expectations of students. In order to do this in math, the national Common Core standards need to be shifted around in order to allow for California's current goal of preparing students to take Algebra I in 8th grade. The following is document is the July 6 draft of the "Wurman-Evers Cascading Plan for a Common Core Pathway to Algebra in 8th Grade." --Ze'ev Wurman & Bill Evers

All CCS K-8 and California K-7 standards are present in this crosswalk.
Only those CCS high school standards that were used to create an Algebra 1 course similar to California are present.
All California Algebra 1 standards are present.

1. CCS standards moved to another grade are in purple font at destination. Their absence is highlighted in turquoise at the point of origin
2. New standards added to CCS under the 15% limit are in blue font
3. Where a CCS standard was modified by adding in-line text, such text is in red font and underlined
4. Key California standards (so-called "green dot standards") are marked by a tan cell highlight

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
	Kindergarten				
CC	**Know number names and the count sequence.** **Count to tell the number of objects.**	**NS**	**KNS1.0 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):**		
CC	K.CC.1. Count to 100 by ones and by tens.				
CC	K.CC.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	**NS**	KNS1.2 Count, recognize, represent, name, and order a number of objects (up to 30).		
CC	K.CC.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).				
CC	**Count to tell the number of objects.** K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality. K.CC.4.a. 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.4.b. 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.4.c. Understand that each successive number name refers to a quantity that is one larger.	**NS**	KNS1.3 Know that the larger numbers describe sets with more objects in them than the smaller numbers have.		
CC	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 many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.				
CC	**Compare numbers.** 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.	**NS**	KNS1.1 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.		
CC	K.CC.7. Compare two numbers between 1 and 10 presented as written numerals.				
OA	**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.**	**NS**	**KNS2.0 Students understand and describe simple additions and subtractions:**		
OA	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.				
OA	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.				
OA	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 knows 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).	**NS**	KNS2.1 Use concrete objects to determine the answers to addition and subtraction problems (for two numbers that are each less than 10).		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Kindergarten		
OA	K.OA.3. Decompose numbers less than 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). 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.				
OA	K.OA.5. Fluently add and subtract within 5.				
		NS	**KNS3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones and tens places:**		
	K.OA.CA-1 Recognize when an estimate is reasonable.	**NS**	KNS3.1 Recognize when an estimate is reasonable.		
NBT	**Work with numbers 11-19 to gain foundations for place value.** 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 that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.				
		AF	**KAF1.0 Students sort and classify objects:**		
MD	K.MD.CA-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).	**AF**	KAF1.1 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).		
MD	**Describe and compare measurable attributes.** K.MD.1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	**MG**	**KMG1.0 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:**		
MD	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. *For example, directly compare the heights of two children and describe one child as taller/shorter. Classify objects and count the number of objects in each category* .	**MG**	KMG1.1 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).		
MD	K.MD.CA-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). a. Name the days of the week. b. 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).	**MG**	KMG1.2 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). KMG1.3 Name the days of the week. KMG1.4 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 concepts of time in Kinder CCS	
MD	K.MD.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count	**MG**	**KMG2.0 Students identify common objects in their environment and describe the geometric features:**		
G	**Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).**	**MG**	KMG2.1 Identify and describe common geometric objects (e.g., circle, triangle, square, rectangle, cube, sphere, cone).		
G	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.				
G	K.G.2. Correctly name shapes regardless of their orientations or overall size				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Kindergarten		
G	K.G.3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").				
G	**Analyze, compare, create, and compose shapes.** 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).	**MG**	KMG2.2 Compare familiar plane and solid objects by common attributes (e.g., position, shape, size, roundness, number of corners).		
G	K.G.5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.				
G	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?"				
		SDAP	**KSDAP1.0 Students collect information about objects and events in their environment:**		
		SDAP	KSDAP1.1 Pose information questions; collect data; and record the results using objects, pictures, and picture graphs.		
		SDAP	KSDAP1.2 Identify, describe, and extend simple patterns (such as circles or triangles) by referring to their shapes, sizes, or colors.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
	Grade 1				
OA	**Represent and solve problems involving addition and subtraction. Add and subtract within 20.**	**NS**	**1NS2.0 Students demonstrate the meaning of addition and subtraction and use these operations to solve problems:**		
OA	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.	**NS**	1NS2.2 Use the inverse relationship between addition and subtraction to solve problems.		
OA	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.		INS2.7		
OA	**Understand and apply properties of operations and the relationship between addition and subtraction.** 1.OA.3. Apply properties of operations as strategies to add and subtract. Examples: If 8 + 3 = 11 is known, then 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.)	**NS**	1NS1.3 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).		
OA	1.OA.4. Understand subtraction as an unknown-addend problem. For example, subtract 10 - 8 by finding the number that makes 10 when added to 8.		1NS2.2		
OA	**Add and subtract within 20.** 1.OA.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	**NS**	1NS2.4 Count by 2s, 5s, and 10s to 100.		
	(1.OA.6. moved to grade 1)				
	(1.OA.1. & 1.NBT.4)	**NS**	1NS2.5 Show the meaning of addition (putting together, increasing) and subtraction (taking away, comparing, finding the difference).		
	(Implied by 1.OA.7 and 1.OA.8)	**AF**	**1AF1.0 Students use number sentences with operational symbols and expressions to solve problems:**		
OA	**Work with addition and subtraction equations.** 1.OA.7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 - 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*	**AF**	1AF1.1 Write and solve number sentences from problem situations that express relationships involving addition and subtraction.		
OA	1.OA.CA-1 Write and solve number sentences from problem situations that express relationships involving addition and subtraction up to sum of 100.			California expectations are to 100	
OA	1.OA.8. Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers.*For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = 0 - 3, 6 + 6 =* 0.	**NS**	1NS2.7 Find the sum of three one-digit numbers.		
OA	**Add and subtract within 20.** 2.OA.2. Fluently add and subtract within 20 using mental strategies. Know from memory all sums of two one-digit numbers.	**NS**	1NS2.1 Know the addition facts (sums to 20) and the corresponding subtraction facts and commit them to memory.	California expects fluency to 20	
		NS	**1NS1.0 Students understand and use numbers up to 100:**		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 1		
NBT	**Extend the counting sequence.** 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.	**NS**	1NS1.1 Count, read, and write whole numbers to 100.		
NBT	**Understand place value.** 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: 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).	**NS**	1NS1.4 Count and group object in ones and tens (e.g., three groups of 10 and 4 equals 34, or 30 + 4).		
NBT	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 <.	**NS**	1NS1.2 Compare and order whole numbers to 100 by using the symbols for less than, equal to, or greater than (<, =, >).		
NBT	**Use place value understanding and properties of operations to add and subtract.** 1.NBT.4. Add within 100, including adding a two-digit number and a one-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; relate 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.	**NS**	1NS2.6 Solve addition and subtraction problems with one-and two-digit numbers (e.g., 5 + 58 = __).		
NBT	1.NBT.CA-1 Solve addition and subtraction problems with one-and two digit numbers (e.g., 5 + 58 = __).			California expects also subtraction	
NBT	1.NBT.5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.				
NBT	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 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.	**NS**	1NS2.3 Identify one more than, one less than, 10 more than, and 10 less than a given number.		
NBT	1.MBT.CA-2 Identify and know the value of coins and show different combinations of coins that equal the same value.	**NS**	1NS1.5 Identify and know the value of coins and show different combinations of coins that equal the same value.	CCS has no money concepts.	
		NS	**1NS3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, and hundreds places:**		
		NS	1NS3.1 Make reasonable estimates when comparing larger or smaller numbers.		
	(Implied by 1.OA.7 and 1.OA.8)	**AF**	1AF1.2 Understand the meaning of the symbols +, -, =.		
	(Implied by 1.OA.7 and 1.OA.8)	**AF**	1AF1.3 Create problem situations that might lead to given number sentences involving addition and subtraction.		
MD	**Measure lengths indirectly and by iterating length units.**	**MG**	**1MG1.0 Students use direct comparison and nonstandard units to describe the measurements of objects:**		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 1		
MD	1.MD.1. Order three objects by length; compare the lengths weight and volume of two objects indirectly by using a third object.				
MD	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) 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.	**MG**	1MG1.1 Compare the length, weight, and volume of two or more objects by using direct comparison or a nonstandard unit.		
MD	**Tell and write time.** 1.MD.3. Tell and write time in hours and half-hours using analog and digital clocks, and relate time to events (e.g., before/after, shorter/longer).	**MG**	1MG1.2 Tell time to the nearest half hour and relate time to events (e.g., before/after, shorter/longer).	California expects also earlier/later comparison	
		SDAP	**1SDAP1.0 Students organize, represent, and compare data by category on simple graphs and charts:**		
	(1.MD.4.)	**SDAP**	1SDAP1.1 Sort objects and data by common attributes and describe the categories.		
MD	**Represent and interpret 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.	**SDAP**	1SDAP1.2 Represent and compare data (e.g., largest, smallest, most often, least often) by using pictures, bar graphs, tally charts, and picture graphs.		
		SDAP	**1SDAP2.0 Students sort objects and create and describe patterns by numbers, shapes, sizes, rhythms, or colors:**		
MD	1.MD.CA-1 Describe, extend, and explain ways to get to a next element in simple repeating patterns (e.g., rhythmic, numeric, color, and shape).	**SDAP**	1SDAP2.1 Describe, extend, and explain ways to get to a next element in simple repeating patterns (e.g., rhythmic, numeric, color, and shape).		
		MG	**1MG2.0 Students identify common geometric figures, classify them by common attributes, and describe their relative position or their location in space:**		
G	**Reason with shapes and their attributes.** 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.	**MG**	1MG2.1 Identify, describe, and compare triangles, rectangles, squares, and circles, including the faces of three-dimensional objects.		
G	(1.G.2. moved to grade 2)	**MG**	1MG2.2 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.		
		MG	1MG2.3 Give and follow directions about location.		
	(Partially in K.G.1.)	**MG**	1MG2.4 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).		
G	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 shares creates smaller shares.				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
	Grade 2				
OA	**Represent and solve problems involving addition and subtraction.** **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.	**NS**	**2NS2.0 Students estimate, calculate, and solve problems involving addition and subtraction of two-and three-digit numbers:**		
	(2.OA.2. moved to grade 1)				
OA	**Work with equal groups of objects to gain foundations for multiplication.**	**NS**	**2NS3.0 Students model and solve simple problems involving multiplication and division:**		
	2.OA.3. Determine whether a group of objects (up to 20) 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.				
OA	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.	**NS**	2NS3.1 Use repeated addition, arrays, and counting by multiples to do multiplication.		
OA	3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*	**SDAP**	**2SDAP2.0 Students demonstrate an understanding of patterns and how patterns grow and describe them in general ways:**		
NBT	**Understand place value.**	**NS**	**2NS1.0 Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000:**		
NBT	2.NBT.1. Understand that the three digits of a 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: a. 100 can be thought of as a bundle of ten tens — called a "hundred." b. 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).	**NS**	2NS1.1 Count, read, and write whole numbers to 1,000 and identify the place value for each digit.		
NBT	2.NBT.2. Count within 1000; skip-count by 5s, 10s, and 100s.				
NBT	2.NBT.3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	**NS**	2NS1.2 Use words, models, and expanded forms (e.g., 45 = 4 tens + 5) to represent numbers (to 1,000).		
NBT	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 comparisons.	**NS**	2NS1.3 Order and compare whole numbers to 1,000 by using the symbols <, =, >.		
NBT	**Use place value understanding and properties of operations to add and subtract.** 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.				
NBT	2.NBT.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 2		
NBT	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.	**NS**	2NS2.2 Find the sum or difference of two whole numbers up to three digits long.		
NBT	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.			California expectations	
NBT	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.	**NS**	2NS2.3 Use mental arithmetic to find the sum or difference of two two-digit numbers.		
NBT	2.NBT.CA-1. Use mental arithmetic to find the sum or difference of two two-digit numbers.			California expectations	
NBT	2.NBT.9. Explain why addition and subtraction strategies work, using place value and the properties of operations.	**NS**	2NS2.1 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.		
NBT	2.NBT.CA-2. Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division.	**NS**	2NS3.2 Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division.		
NBT	2.NBT.CA-3. Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory.	**NS**	2NS3.3 Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory.		
		NS	**2NS4.0 Students understand that fractions and decimals may refer to parts of a set and parts of a whole:**		
NBT	2.NBT.CA-4. Recognize, name, and compare unit fractions from 1/12 to 1/2NS2.	**NS**	2NS4.1 Recognize, name, and compare unit fractions from 1/12 to 1/2NS2.		
		NS	2NS4.2 Recognize fractions of a whole and parts of a group (e.g., one-fourth of a pie, two-thirds of 15 balls).		
MD	**Measure and estimate lengths in standard units.** 2.MD.1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes to the nearest inch and/ or centimeter.	**MG**	2MG1.3 Measure the length of an object to the nearest inch and/ or centimeter.	CCS has no precision expectations	
MD	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.	**MG**	2MG1.2 Use different units to measure the same object and predict whether the measure will be greater or smaller when a different unit is used.		
		NS	**2NS6.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places:**		
MD	2.MD.3. Estimate lengths using units of inches, feet, centimeters, and meters.	**NS**	2NS6.1 Recognize when an estimate is reasonable in measurements (e.g., closest inch).		
MD	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.				
		AF	**2AF1.0 Students model, represent, and interpret number relationships to create and solve problems involving addition and subtraction:**		
		AF	2AF1.1 Use the commutative and associative rules to simplify mental calculations and to check results.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
	Grade 2				
MD	**Relate addition and subtraction to length.** 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 the unknown number to represent the problem.	**AF**	2AF1.2 Relate problem situations to number sentences involving addition and subtraction.		
MD	2.MD.CA-1. Relate problem situations to number sentences involving addition and subtraction. a. Solve addition and subtraction problems by using data from simple charts, picture graphs, and number sentences.	**AF**	2AF1.3 Solve addition and subtraction problems by using data from simple charts, picture graphs, and number sentences.		
MD	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.				
MD	**Work with time and money.** 2.MD.7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year).	**MG**	2MG1.4 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).	CCS doesn't mention minutes/hour, days/month, etc.	
MD	2.MD.CA-2. Determine the duration of intervals of time in hours (e.g., 11:00 a.m. to 4:00 p.m.).	**MG**	2MG1.5 Determine the duration of intervals of time in hours (e.g., 11:00 a.m. to 4:00 p.m.).		
		NS	**2NS5.0 Students model and solve problems by representing, adding, and subtracting amounts of money:**		
MD	2.MD.8. Solve word problems involving combinations of dollar bills, quarters, dimes, nickels, and pennies coins, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?	**NS**	2NS5.1 Solve problems using combinations of coins and bills.	California expects handling combinations of both coins and bills	
		NS	2NS5.2 Know and use the decimal notation and the dollar and cent symbols for money.		
MD	**Represent and interpret data.**				
MD	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.				
MD	2.MD.10. Draw a picture graph and a 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.	**SDAP**	2SDAP1.4 Ask and answer simple questions related to data representations.		
		MG	**2MG1.0 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:**		
		MG	2MG1.1 Measure the length of objects by iterating (repeating) a nonstandard or standard unit.		
G	**Reason with shapes and their attributes.**	**MG**	**2MG2.0 Students identify and describe the attributes of common figures in the plane and of common objects in space:**		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 2		
G	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.	**MG**	2MG2.1 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.		
G	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.	**MG**	2MG2.2 Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can be arranged to form a rectangle).		
G	2.G.2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.				
		SDAP	**2SDAP1.0 Students collect numerical data and record, organize, display, and interpret the data on bar graphs and other representations:**		
		SDAP	2SDAP1.1 Record numerical data in systematic ways, keeping track of what has been counted.		
		SDAP	2SDAP1.2 Represent the same data set in more than one way (e.g., bar graphs and charts with tallies).		
		SDAP	2SDAP1.3 Identify features of data sets (range and mode).		
		SDAP	2SDAP2.1 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).		
		SDAP	2SDAP2.2 Solve problems involving simple number patterns.		
G	2.G.3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the 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.	**NS**	2NS4.3 Know that when all fractional parts are included, such as four-fourths, the result is equal to the whole and to one.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 3		
	Represent and solve problems involving multiplication and division. **3.OA.**1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.				
	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 when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.				
	3.OA.3. Use multiplication and division within 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.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = 0 ÷ 3, 6 × 6 = ?.				
OA	**Understand properties of multiplication and the relationship between multiplication and division.** **3.OA.**5. Apply properties of operations as strategies to multiply and divide. Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)	**NS**	3NS2.6 Understand the special properties of 0 and 1 in multiplication and division.		
OA	3.OA.6. Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	**NS**	3NS2.5 Solve division problems in which a multidigit number is evenly divided by a one-digit number (135 ÷ 5 = __).		
OA	**Multiply and divide within 100.** 3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	**NS**	3NS2.2 Memorize to automaticity the multiplication table for numbers between 1 and 10.		
		AF	**3AF1.0 Students select appropriate symbols, operations, and properties to represent, describe, simplify, and solve simple number relationships:**		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 3		
OA	**Solve problems involving the four operations, and identify and explain patterns in arithmetic.** 3.OA.8. Solve two-step word problems using the four operations. Represent these problems using equations or inequalities with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	**AF**	3AF1.1 Represent relationships of quantities in the form of mathematical expressions, equations, or inequalities.	California expects also inequalities	
	(3.OA.8.)	**AF**	3AF1.2 Solve problems involving numeric equations or inequalities.		
OA	3.OA.CA-1. Select appropriate operational and relational symbols to make an expression true (e.g., if 4 __ 3 = 12, what operational symbol goes in the blank?). a. Express simple unit conversions in symbolic form (e.g., __ inches = __ feet x 12). b. Determine the unit cost when given the total cost and number of units. c. Solve simple problems involving a functional relationship between two quantities (e.g., find the total cost of multiple items given the cost per unit). d. 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?).	**AF**	3AF1.3 Select appropriate operational and relational symbols to make an expression true (e.g., if 4 __ 3 = 12, what operational symbol goes in the blank?).	California expects work with units.	
		AF	3AF1.4 Express simple unit conversions in symbolic form (e.g., __ inches = __ feet x 12).		
		AF	3AF1.5 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?).		
		AF	**3AF2.0 Students represent simple functional relationships:**		
		AF	3AF2.1 Solve simple problems involving a functional relationship between two quantities (e.g., find the total cost of multiple items given the cost per unit).		
	Generate and analyze patterns. **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 example, 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*	**AF**	3AF2.2 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).		
	(3.OA.9. moved to grade 2)				
NBT	**Use place value understanding and properties of operations to perform multi-digit arithmetic.**	**NS**	**3NS1.0 Students understand the place value of whole numbers:**		
		NS	3NS1.1 Count, read, and write whole numbers to 10,000.		
		NS	3NS1.2 Compare and order whole numbers to 10,000.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 3		
	(4.NBT.2.)	**NS**	3NS1.3 Identify the place value for each digit in numbers to 10,000.		
NBT	3.NBT.1. Use place value understanding to round whole numbers to the nearest 10 or 100.	**NS**	3NS1.4 Round off numbers to 10,000 to the nearest ten, hundred, and thousand.		
NBT	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.	**NS**	3NS1.5 Use expanded notation to represent numbers (e.g., 3,206 = 3,000 + 200 + 6).		
		NS	**3NS2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division:**		
NBT	4.NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	**NS**	3NS2.1 Find the sum or difference of two whole numbers between 0 and 10,000.	Note: This standard is copied (not moved) from grade 4. Framework should limit it to 10,000.	
	(3.NBT.2. moved to grade 2)				
		NS	3NS2.3 Use the inverse relationship of multiplication and division to compute and check results.		
NBT	3.NBT.3. Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	**NS**	3NS2.4 Solve simple problems involving multiplication of multidigit numbers by one-digit numbers (3,671 x 3 = __).		
		NS	3NS2.7 Determine the unit cost when given the total cost and number of units.		
	(3.OA.8.)	**NS**	3NS2.8 Solve problems that require two or more of the skills mentioned above.		
		NS	**3NS3.0 Students understand the relationship between whole numbers, simple fractions, and decimals:**		
NF	**Develop understanding of fractions as numbers.** 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.	**NS**	3NS3.1 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).		
NF	3.NF.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. 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. b. 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	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 3		
NF	3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram. d. 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 >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.				
		NS	3NS3.2 Add and subtract simple fractions (e.g., determine that 1/8 + 3/8 is the same as 1/2).		
MD	**Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.** 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.				
		MG	**3MG1.0 Students choose and use appropriate units and measurement tools to quantify the properties of objects:**		
MD	3.MD.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg) and English units (oz., lb.), 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.	**MG**	3MG1.1 Choose the appropriate tools and units (metric and U.S.) and estimate and measure the length, liquid volume, and weight/mass of given objects.		
MD	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.	**NS**	3NS3.3 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.		
MD	3.MD.CA-1. 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).	**NS**	3NS3.4 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).	Early work on fraction-decimal conversion. Not treated in CCS	

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
	Grade 3				
MD	**Represent and interpret data** 3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*	**SDAP**	3SDAP1.3 Summarize and display the results of probability experiments in a clear and organized way (e.g., use a bar graph or a line plot).		
MD	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.				
MD	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.** 3.MD.5. Recognize area as an attribute of plane figures and understand concepts of area measurement. a. 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. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.	**MG**	3MG1.2 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.		
MD	3.MD.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).				
MD	3.MD.CA-2. Carry out simple unit conversions within a system of measurement (e.g., centimeters and meters, hours and minutes).	**MG**	3MG1.4 Carry out simple unit conversions within a system of measurement (e.g., centimeters and meters, hours and minutes).	California expects work with units	
MD	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 × b and a × c. Use area models to represent the distributive property in mathematical reasoning. d. Recognize area as 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.				
MD	**Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.** 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.	**MG**	3MG1.3 Find the perimeter of a polygon with integer sides.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 3		
		MG	**3MG2.0 Students describe and compare the attributes of plane and solid geometric figures and use their understanding to show relationships and solve problems:**		
G	3.G.CA-1. Identify, describe, and classify polygons (including pentagons, hexagons, and octagons). a. 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). b. Identify right angles in geometric figures or in appropriate objects and determine whether other angles are greater or less than a right angle.	**MG**	3MG2.1 Identify, describe, and classify polygons (including pentagons, hexagons, and octagons).	CCS did part of it in previous grade (2.G.1)	
		MG	3MG2.2 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).		
G	**Reason with shapes and their attributes**. 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.	**MG**	3MG2.3 Identify attributes of quadrilaterals (e.g., parallel sides for the parallelogram, right angles for the rectangle, equal sides and right angles for the square).		
		MG	3MG2.4 Identify right angles in geometric figures or in appropriate objects and determine whether other angles are greater or less than a right angle.		
G	3.G.CA-2. Identify, describe, and classify common three-dimensional geometric objects (e.g., cube, rectangular solid, sphere, prism, pyramid, cone, cylinder). a. Identify common solid objects that are the components needed to make a more complex solid object.	**MG**	3MG2.5 Identify, describe, and classify common three-dimensional geometric objects (e.g., cube, rectangular solid, sphere, prism, pyramid, cone, cylinder).		
		MG	3MG2.6 Identify common solid objects that are the components needed to make a more complex solid object.		
G	3.G.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.*				
		SDAP	**3SDAP1.0 Students conduct simple probability experiments by determining the number of possible outcomes and make simple predictions:**		
		SDAP	3SDAP1.1 Identify whether common events are certain, likely, unlikely, or improbable.		
		SDAP	3SDAP1.2 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.		
		SDAP	3SDAP1.4 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).		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 4		
OA	**Use the four operations with whole numbers to solve problems.** 4.OA.1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 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.				
	4.OA.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.				
		AF	**4AF1.0 Students use and interpret variables, mathematical symbols, and properties to write and simplify expressions and sentences:**		
OA	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.	**AF**	4AF1.1 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).		
OA	5.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	**AF**	4AF1.2 Interpret and evaluate mathematical expressions that now use parentheses.		
		AF	4AF1.3 Use parentheses to indicate which operation to perform first when writing expressions containing more than two terms and different operations.		
		NS	**4NS4.0 Students know how to factor small whole numbers:**		
		NS	4NS4.1 Understand that many whole numbers break down in different ways (e.g., 12 = 4 x 3 = 2 x 6 = 2 x 2 x 3).		
OA	**Gain familiarity with factors and multiples**. 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.	**NS**	4NS4.2 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.		
	(4.OA.5. moved to grade 3)				
		AF	4AF1.5 Understand that an equation such as y = 3 x + 5 is a prescription for determining a second number when a first number is given.		
	4.OA.CA-1. Students know how to manipulate equations: a. Know and understand that equals added to equals are equal. b. Know and understand that equals multiplied by equals are equal.	**AF**	**4AF2.0 Students know how to manipulate equations:**		
		AF	4AF2.1 Know and understand that equals added to equals are equal.	California expects developing early fluency with properties of equations	
		AF	4AF2.2 Know and understand that equals multiplied by equals are equal.		
		NS	**4NS1.0 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:**		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 4		
NBT	**Generalize place value understanding for multi-digit whole numbers.** 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 example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division* .	**NS**	4NS1.1 Read and write whole numbers in the millions.		
		NS	4NS1.2 Order and compare whole numbers and decimals to two decimal places.		
	(4.NBT.2. moved to grade 3)				
NBT	4.NBT.3. Use place value understanding to round multi-digit whole numbers to any place.	**NS**	4NS1.3 Round whole numbers through the millions to the nearest ten, hundred, thousand, ten thousand, or hundred thousand.		
	4.NBT.CA-1. Decide when a rounded solution is called for and explain why such a solution may be appropriate.	**NS**	4NS1.4 Decide when a rounded solution is called for and explain why such a solution may be appropriate.	California expects also understanding when rounding is appropriate	
NBT	**Use place value understanding and properties of operations to perform multi-digit arithmetic.**	**NS**	**4NS3.0 Students solve problems involving addition, subtraction, multiplication, and division of whole numbers and understand the relationships among the operations:**		
NBT	4.NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	**NS**	4NS3.1 Demonstrate an understanding of, and the ability to use, standard algorithms for the addition and subtraction of multi digit numbers.		
NBT	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.	**NS**	4NS3.2 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.		
NBT	5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm.	**NS**	4NS3.3 Solve problems involving multiplication of multi digit numbers by two-digit numbers.		
NBT	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.	**NS**	4NS3.4 Solve problems involving division of multi digit numbers by one-digit numbers.		
NF	**Extend understanding of fraction equivalence and ordering.** 4.NF.1. Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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.		4NS1.5 Explain different interpretations of fractions, for example, parts of a whole, parts of a set, and division of whole numbers by whole numbers; explain equivalents of fractions (see Standard 4NS4.0).		
NF	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 1/2. 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.				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 4		
NF	**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.** 4.NF.3. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. 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. Examples: 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. c. 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. d. 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.	**NS**			
NF	4.NF.CA-1. 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).	**NS**	4NS1.6 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).	California continues to develop conversion fluency with different forms of fractions.	
		NS	4NS1.7 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.		
NF	4.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4). b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.) c. 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. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?				
NF	4.NF.CA-2. Use concepts of negative numbers (e.g., on a number line, in counting, in temperature, in "owing").	**NS**	4NS1.8 Use concepts of negative numbers (e.g., on a number line, in counting, in temperature, in "owing").		
NF	A. Identify on a number line the relative position of positive fractions, positive mixed numbers, and positive decimals to two decimal places.	**NS**	4NS1.9 Identify on a number line the relative position of positive fractions, positive mixed numbers, and positive decimals to two decimal places.	Early concepts of negative numbers	

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 4		
NF	**Understand decimal notation for fractions, and compare decimal fractions.** 4.NF.5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*	**NS**	**4NS2.0 Students extend their use and understanding of whole numbers to the addition and subtraction of simple decimals:**		
NF	4.NF.6. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.				
NF	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.	**NS**	4NS2.1 Estimate and compute the sum or difference of whole numbers and positive decimals to two places.		
NF	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 >, =, or <, and justify the conclusions, e.g., by using a visual model.	**NS**	4NS2.2 Round two-place decimals to one decimal or the nearest whole number and judge the reasonableness of the rounded answer.		
		MG	**4MG1.0 Students understand perimeter and area:**		
MD	**Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.** 4.MD.1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; 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. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*	**MG**	4MG1.1 Measure the area of rectangular shapes by using appropriate units, such as square centimeter (cm2), square meter (m2), square kilometer (km2), square inch (in2), square yard (yd2), or square mile (mi2).		
MD	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.			Copied to grade 3 too	
MD	4.MD.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor .*	**AF**	4AF1.4 Use and interpret formulas (e.g., area = length x width or A = lw) to answer questions about quantities and their relationships.		
		MG	4MG1.2 Recognize that rectangles that have the same area can have different perimeters.		
		MG	4MG1.3 Understand that rectangles that have the same perimeter can have different areas.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 4		
	(4.MD.3.)	**MG**	4MG1.4 Understand and use formulas to solve problems involving perimeters and areas of rectangles and squares. Use those formulas to find the areas of more complex figures by dividing the figures into basic shapes.		
MD	**Represent and interpret data.** **4.MD.**4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.	**SDAP**	4SDAP1.3 Interpret one-and two-variable data graphs to answer questions about a situation.		
MD	**Geometric measurement: understand concepts of angle and measure angles.** **4.MD.**5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: 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. b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.				
MD	4.MD.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.				
MD	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.				
MD	4.MD.CA-1. Students use two-dimensional coordinate grids to represent points and graph lines and simple figures: a. 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). b. Understand that the length of a horizontal line segment equals the difference of the x- coordinates. c. Understand that the length of a vertical line segment equals the difference of the y- coordinates.	**MG**	**4MG2.0 Students use two-dimensional coordinate grids to represent points and graph lines and simple figures:**		
		MG	4MG2.1 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).	Early concepts of coordinate plane	
		MG	4MG2.2 Understand that the length of a horizontal line segment equals the difference of the x- coordinates.		
		MG	4MG2.3 Understand that the length of a vertical line segment equals the difference of the y- coordinates.		
		MG	**4MG3.0 Students demonstrate an understanding of plane and solid geometric objects and use this knowledge to show relationships and solve problems:**		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 4		
G	**Draw and identify lines and angles, and classify shapes by properties of their lines and angles.** 4.G.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	**MG**	4MG3.1 Identify lines that are parallel and perpendicular.		
		MG	4MG3.2 Identify the radius and diameter of a circle.		
		MG	4MG3.3 Identify congruent figures.		
G	(4.G.1.)	**MG**	4MG3.5 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.		
		MG	4MG3.6 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.		
G	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.	**MG**	4MG3.7 Know the definitions of different triangles (e.g., equilateral, isosceles, scalene) and identify their attributes.		
G	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.	**MG**	4MG3.4 Identify figures that have bilateral and rotational symmetry.		
		MG	4MG3.8 Know the definition of different quadrilaterals (e.g., rhombus, square, rectangle, parallelogram, trapezoid).		
		SDAP	**4SDAP1.0 Students organize, represent, and interpret numerical and categorical data and clearly communicate their findings:**		
		SDAP	4SDAP1.1 Formulate survey questions; systematically collect and represent data on a number line; and coordinate graphs, tables, and charts.		
		SDAP	4SDAP1.2 Identify the mode(s) for sets of categorical data and the mode(s), median, and any apparent outliers for numerical data sets.		
		SDAP	**4SDAP2.0 Students make predictions for simple probability situations:**		
		SDAP	4SDAP2.1 Represent all possible outcomes for a simple probability situation in an organized way (e.g., tables, grids, tree diagrams).		
		SDAP	4SDAP2.2 Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4; 3 /4).		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 5		
	(5.OA.1. moved to grade 4)	**AF**	**5AF1.0 Students use variables in simple expressions, compute the value of the expression for specific values of the variable, and plot and interpret the results:**		
		AF	5AF1.1 Use information taken from a graph or equation to answer questions about a problem situation.		
OA	5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	**AF**	5AF1.2 Use a letter to represent an unknown number; write and evaluate simple algebraic expressions in one variable by substitution.		
		AF	5AF1.3 Know and use the distributive property in equations and expressions with variables.		
OA	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 example, 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.*	**AF**			
OA	5.OA.CA-1. Understand and compute positive integer powers of nonnegative integers; compute examples as repeated multiplication.	**NS**	5NS1.3 Understand and compute positive integer powers of nonnegative integers; compute examples as repeated multiplication.		
OA	5.OA.CA-2. 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 = 23 x 3).	**NS**	5NS1.4 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 = 23 x 3).	Prime factorization is absent in CCS	
NBT	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.	**NS**			
	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.				
		NS	**5NS1.0 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:**		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 5		
	5.NBT.3. Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**NS**	5NS1.1 Estimate, round, and manipulate very large (e.g., millions) and very small (e.g., thousandths) numbers.		
NBT	5.NBT.4. Use place value understanding to round decimals to any place.				
	(5.NBT.5. moved to grade 4)				
NBT	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. moved to grade 4)				
NS	7.NS.2.d. 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.	**NS**	5NS1.2 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.	California develops fluency with conversion among various forms of fractions	
		NS	5NS1.5 Identify and represent on a number line decimals, fractions, mixed numbers, and positive and negative integers.	As above	
		NS	**5NS2.0 Students perform calculations and solve problems involving addition, subtraction, and simple multiplication and division of fractions and decimals:**		
NS	6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.	**NS**	5NS2.1 Add, subtract, multiply, and divide with decimals; add with negative integers; subtract positive integers from negative integers; and verify the reasonableness of the results.	California develops understanding of negative numbers at this grade	
NS	6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	**NS**	5NS2.2 Demonstrate proficiency with division, including division with positive decimals and long division with multidigit divisors.		
NS	6.NS.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 5		
NS	6.NS.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.				
NF	5.NF1. 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. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)	**NS**	5NS2.3 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.		
	5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, 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. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.				
NF	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.** 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. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get?*	**NS**	5NS2.4 Understand the concept of multiplication and division of fractions.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 5		
	5.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product (a/b) × q as a parts of a 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.)* b. 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.				
NF	5.NF.5. Interpret multiplication 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 than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a 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×a)/(n×b) to the effect of multiplying a/b by 1.				
NF	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.	**NS**	5NS2.5 Compute and perform simple multiplication and division of fractions and apply these procedures to solving problems.		
	5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. b. Interpret division of a whole number by a unit fraction, and compute such quotients. c. 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. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*				
		MG	**5MG1.0 Students understand and compute the volumes and areas of simple objects:**		
MD	5.MD.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	**MG**	5MG1.3 Understand the concept of volume and use the appropriate units in common measuring systems (i.e., cubic centimeter [cm3], cubic meter [m3], cubic inch [in3], cubic yard [yd3]) to compute the volume of rectangular solids.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 5		
MD	5.MD.2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally*.				
MD	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.** 5.MD.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. 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. b. 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.	**MG**			
	5.MD.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.				
MD	5.MD.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. 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 edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. c. 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.	**MG**	-"-		
		MG	5MG1.4 Differentiate between, and use appropriate units of measures for, two-and three-dimensional objects (i.e., find the perimeter, area, volume).		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 5		
G	**Graph points on the coordinate plane to solve real-world and mathematical problems.** **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 plane 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).	**AF**	5AF1.4 Identify and graph ordered pairs in the four quadrants of the coordinate plane.		
G	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.	**AF**	5AF1.5 Solve problems involving linear functions with integer values; write the equation; and graph the resulting ordered pairs of integers on a grid.		
G	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.				
		MG	**5MG2.0 Students identify, describe, and classify the properties of, and the relationships between, plane and solid geometric figures:**		
G	**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. Fo example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles. 5.G.4. Classify two-dimensional figures in a hierarchy based on properties.	**MG**			
G	5.G.CA-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).	**MG**	5MG2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).	CCS doesn't require use of compass or straightedge throughout K-8	
G	5.G.CA-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.	**MG**	5MG2.2 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.	Sum of angles in a triangle is not addressed explicitly in CCS	
	5.G.CA-3. 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).	**MG**	5MG1.1 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).	Area of triangle is not explicitly addressed in CCS	
	5.G.CA-4. Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area for these objects.	**MG**	5MG1.2 Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area for these objects.		
		MG	5MG2.3 Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 5		
		SDAP	**5SDAP1.0 Students display, analyze, compare, and interpret different data sets, including data sets of different sizes:**		
		SDAP	5SDAP1.1 Know the concepts of mean, median, and mode; compute and compare simple examples to show that they may differ.		
		SDAP	5SDAP1.2 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.		
		SDAP	5SDAP1.3 Use fractions and percentages to compare data sets of different sizes.		
		SDAP	5SDAP1.4 Identify ordered pairs of data from a graph and interpret the meaning of the data in terms of the situation depicted by the graph.		
	(5.G.1.)	**SDAP**	5SDAP1.5 Know how to write ordered pairs correctly; for example, (x, y).		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
RP	**Understand ratio concepts and use ratio reasoning to solve problems.** **6.RP.**1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.*For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	**NS**	6NS1.2 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).		
	6.RP.2. Understand the concept of a unit rate a/b associated with a ratio a:b with b ¹ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*				
		AF	**6AF2.0 Students analyze and use tables, graphs, and rules to solve problems involving rates and proportions:**		
RP	6.RP.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	**NS**	6NS1.3 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.		
RP	6.RP.3.b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*	**AF**	6AF2.3 Solve problems involving rates, average speed, distance, and time.		
	6.RP.3.c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.			First time percents appear in CCS	
RP	6.RP.3.d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	**AF**	6AF2.1 Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches).		
RP	7.RP.3. Use 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.	**NS**	6NS1.4 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.		
RP	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. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*	**AF**	6AF2.2 Demonstrate an understanding that rate is a measure of one quantity per unit value of another quantity.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
RP	7.RP.2. Recognize and represent proportional relationships between quantities. a. 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. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations.*For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* d. Explain what 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.				
		NS	**6NS2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division:**		
NS	6.NS.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.*For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*	**NS**	6NS2.1 Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation.		
NS	(6.NS.1.)	**NS**	6NS2.2 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).		
	6.NS.2. moved to grade 5				
	6.NS.3. moved to grade 5				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
NS	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. a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged. b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on 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. c. 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. d. Apply properties of operations as strategies to add and subtract rational numbers.	**NS**	6NS2.3 Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations, that use positive and negative integers and combinations of these operations.		
NS	7.NS.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. 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 rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b. 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. c. Apply properties of operations as strategies to multiply and divide rational numbers.				
NS	6.NS.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).*	**NS**	6NS2.4 Determine the least common multiple and the greatest common divisor of whole		
	6.NS.5. moved to grade 5				
	6.NS.6. moved to grade 5				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
NS	6.NS.7. Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3 oC > -7 oC to express the fact that -3 oC is warmer than -7 oC. c. 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. For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars. d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.				
		NS	**6NS1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers. Students solve problems involving fractions, ratios, proportions, and percentages:**		
		NS	6NS1.1 Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line.		
	6.NS.8. moved to grade 5				
	6.EE.1. Write and evaluate numerical expressions involving whole-number exponents.				
		AF	**6AF1.0 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:**		
		AF	6AF1.1 Write and solve one-step linear equations in one variable.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
EE	6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 - y.* b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.* c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2.*	**AF**	6AF1.2 Write and evaluate an algebraic expression for a given situation, using up to three variables.		
EE	*6.EE.* 3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	**AF**	6AF1.3 Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process.		
	6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*				
EE	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.				
EE	6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	**AF**	6AF1.4 Solve problems manually by using the correct order of operations or by using a scientific calculator.		
	6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.	**AF**	**6AF3.0 Students investigate geometric patterns and describe them algebraically:**		
EE	6.EE.8. Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	**AF**	6AF3.1 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).		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
EE	6.EE.9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.	**AF**	6AF3.2 Express in symbolic form simple relationships arising from geometry.		
		MG	**6MG1.0 Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems:**		
G	6.G.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	**MG**			
G	6.G.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	**MG**	6MG1.3 Know and use the formulas for the volume of triangular prisms and cylinders (area of base x height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid.		
G	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.	**MG**			
G	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.	**MG**			
G	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.	**MG**	6MG1.1 Understand the concept of a constant such as π; know the formulas for the circumference and area of a circle.	Pi is not explicitly addressed in CCS	
		MG	6MG1.2 Know common estimates of p (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements.		
		MG	**6MG2.0 Students identify and describe the properties of two-dimensional figures:**		
		MG	6MG2.1 Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms.		
G	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.	**MG**	6MG2.2 Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle.	CCS is not explicit about sum of angles	

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
G	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.	**MG**	6MG2..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).		
SP	6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	**SDAP**			
	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.				
SP	6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	**SDAP**			
		SDAP	**6SDAP1.0 Students compute and analyze statistical measurements for data sets:**		
SP	6.SP.5. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. c. Giving quantitative measures of center (median and/or mean) and variability (inter-quartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	**SDAP**	6SDAP1.1 Compute the range, mean, median, and mode of data sets.		
		SDAP	6SDAP1.2 Understand how additional data added to data sets may affect these computations of measures of central tendency.		
		SDAP	6SDAP1.3 Understand how the inclusion or exclusion of outliers affects measures of central tendency.		
		SDAP	6SDAP1.4 Know why a specific measure of central tendency (mean, median) provides the most useful information in a given context.		
SP	**Use random sampling to draw inferences about a population.**	**SDAP**	**6SDAP2.0 Students use data samples of a population and describe the characteristics and limitations of the samples:**		
SP	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.	**SDAP**	6SDAP2.1 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.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
SP	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 variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*	**SDAP**	6SDAP2.2 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.		
		SDAP	6SDAP2.3 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.		
		SDAP	6SDAP2.4 Identify data that represent sampling errors and explain why the sample (and the display) might be biased.		
		SDAP	6SDAP2.5 Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims.		
		SDAP	**6SDAP3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events:**		
		SDAP	6SDAP3.1 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.		
SP	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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	**SDAP**	6SDAP3.3 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.		
SP	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.*	**SDAP**	6SDAP3.2 Use data to estimate the probability of future events (e.g., batting averages or number of accidents per mile driven).		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 6		
	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. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.* b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.*For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*				
SP	7.SP.8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. 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. b. 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.* c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*				
		SDAP	6SDAP3.4 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.		
		SDAP	6SDAP3.5 Understand the difference between independent and dependent events.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 7		
	7.NS.1.a-d moved to grade 6				
	7.NS.2.a-b moved to grade 6				
	7NS1.2 Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.	**NS**	7NS1.2 Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.		
NS	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.	**NS**	7NS1.4 Differentiate between rational and irrational numbers.		
NS	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., p2).*For example, by truncating the decimal expansion of Ö2, show that Ö2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations*.	**NS**	7NS1.5 Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions.		
		NS	7NS1.6 Calculate the percentage of increases and decreases of a quantity.		
NS	7.NS.3. Solve real-world and mathematical problems involving the four operations with rational numbers.	**NS**	7NS1.7 Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest.		
	7.RP.1 moved to grade 6				
	7.RP.2.a-d. moved to grade 6				
	7.RP.3. moved to grade 6				
		AF	**7AF1.0 Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs:**		
EE	7.EE.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	**AF**	7AF1.3 Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used.		
	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 in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."				
		AF	7AF1.4 Use algebraic terminology (e.g., variable, equation, term, coefficient, inequality, expression, constant) correctly.		
		AF	7AF1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.		
		AF	**7AF2.0 Students interpret and evaluate expressions involving integer powers and simple roots:**		
		AF	7AF2.1 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.		
		AF	7AF2.2 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.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 7		
EE	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.*For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*	**NS**	7NS1.3 Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.		
		AF	**7AF4.0 Students solve simple linear equations and inequalities over the rational numbers:**		
EE	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. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*	**AF**	7AF4.1 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.		
EE	7.EE.4.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. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions*	**AF**	7AF1.1 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).		
		AF	7AF1.2 Use the correct order of operations to evaluate algebraic expressions such as 3(2x + 5)7AF2.		
EE	8.EE.7. Solve linear equations in one variable. 8.EE.7.a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers). 8.EE.7.b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	**AF**	7AF4.2 Solve multi step problems involving rate, average speed, distance, and time or a direct variation.		
		NS	**7NS2.0 Students use exponents, powers, and roots and use exponents in working with fractions:**		
EE	8.EE.1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	**NS**	7NS2.1 Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.		
		NS	7NS2.2 Add and subtract fractions by using factoring to find common denominators.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 7		
		NS	7NS2.3 Multiply, divide, and simplify rational numbers by using exponent rules.		
		NS	7NS2.4 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.		
		NS	7NS2.5 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.		
		AF	**7AF3.0 Students graph and interpret linear and some nonlinear functions:**		
EE	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.	**AF**	7AF3.1 Graph functions of the form y = nx2 and y = nx3 and use in solving problems.		
		AF	7AF3.2 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).		
EE	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. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	**AF**	7AF3.3 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.		
EE	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.	**AF**	7AF3.4 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.		
		NS	**7NS1.0 Students know the properties of, and compute with, rational numbers expressed in a variety of forms:**		
EE	8.EE.3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as* 3×10^8 *and the population of the world as* 7×10^9*, and determine that the world population is more than 20 times larger.*	**NS**	7NS1.1 Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.		
	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 or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 7		
		MG	**7MG1.0 Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems:**		
		MG	7MG1.1 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).		
G	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.	**MG**	7MG1.2 Construct and read drawings and models made to scale.		
	7.G.2. moved to grade 6				
	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.				
	7.G.CA-1. 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.	**MG**	7MG1.3 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.		
	7.G.4. moved to grade 6				
	7.G.5. moved to grade 6				
		MG	**7MG2.0 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:**		
G	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.	**MG**	7MG2.1 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.		
G	(7.G.6)	**MG**	7MG2.2 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.		
G	(7.G.6)	**MG**	7MG2.3 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.		
		MG	7MG2.4 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 ft2] = [144 in2], 1 cubic inch is approximately 16.38 cubic centimeters or [1 in3] = [16.38 cm3]).		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 7		
G	8.G.6. Explain a proof of the Pythagorean Theorem and its converse.	**MG**	**7MG3.0 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:**		
	7.G.CA-2. 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.	**MG**	7MG3.1 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.	California expects geomterical constructions.	
G	8.G.8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	**MG**	7MG3.2 Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections.		
G	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.	**MG**	7MG3.3 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.		
	7.G.CA-3. 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.	**MG**	7MG3.4 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.		
G	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.	**MG**	7MG3.5 Construct two-dimensional patterns for three-dimensional models, such as cylinders, prisms, and cones.		
	7.G.CA-4. 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).	**MG**	7MG3.6 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).		
	7.SP.1. moved to grade 6				
	7.SP.2. moved to grade 6				
		SDAP	**7SDAP1.0 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:**		
		SDAP	7SDAP1.1 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.		

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments	
			Grade 7		
SP	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. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* *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. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*	**SDAP**	7SDAP1.2 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).		
		SDAP	7SDAP1.3 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.		
	7.SP.4. moved to grade 6				
	7.SP.5. moved to grade 6				
	7.SP.6. moved to grade 6				
	7.SP.7. moved to grade 6				
SP	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.				
SP	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.				
SP	8.SP.3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*				
SP	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.*For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*				

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments
		Grade 8	Algebra 1	
	8.G.1-5 moved to HS Geometry			
	8.G.9. moved to HS Geometry			
	8.NS.1-2 moved to grade 7			
	8.EE.1-7 moved to grade 7			
	8.G.6-8 moved to grade 7			
	8.SP.1-4 moved to grade 7			
8	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.	**9**	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.	
		3	Students solve equations and inequalities involving absolute values.	
8	**Define, evaluate, and compare 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.	**16**	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	8.F.2. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*			
8	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. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*	**7**	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	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.	There seem to be no discussion of parallel & perpendicular lines except when possibly implied in 8.EE.7.a (now in grade 7)

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments
		Grade 8	Algebra 1	
8	**Use functions to model relationships between quantities.** 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.	**18**	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	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 or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	**18**		
HS	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. For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.	**2**	Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents.	
HS	N-RN-2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	**2**		
HS	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.	**1**	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:	
HS	A-SSE-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.	**11**	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.	
HS	A-SSE-2. Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).	**11**		
HS	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. c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	**22**	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.	

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments
		Grade 8	**Algebra 1**	
HS	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	**10**	Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques.	
HS	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).	**12**	Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms.	
HS	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.	**12**		
HS	A-APR-4. Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x2 + y2)2 = (x2 – y2)2 + (2xy)2 can be used to generate Pythagorean triples.	**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.	
HS	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.	**10**		
HS	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.	**13**	Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques.	
HS	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.	**5**	Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.	
HS	(A-CED-1)	**23**	Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.	
HS	A-CED-2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	**9**		
HS	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. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	**9**		
HS	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	**10**		
HS	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.	**1.1, 5**	1.1 Students use properties of numbers to demonstrate whether assertions are true or false.	
HS	A-REI-2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	**5**	Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.	

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments
		Grade 8	**Algebra 1**	
HS	A-REI-3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**4, 5**	4. Students simplify expressions before solving linear equations and inequalities in one variable, such as 3(2*x* -5) + 4(*x* -2) = 12.	
HS	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.	**14**	Students solve a quadratic equation by factoring or completing the square.	
HS	(A-REI-4.a)	**19**	Students know the quadratic formula and are familiar with its proof by completing the square.	
HS	A-REI-4.b. Solve quadratic equations by inspection (e.g., for x2 = 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 ± bi for real numbers a and b.	**15**	Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.	Complex solutions should not be taught in Algebra 1
HS	(A-REI-4.b.)	**20**	Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.	
HS	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.	**9, 25.3**		
HS	A.REI-6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables	**9**		
HS	A-REI-7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.			No direct correlation to Calif. But seems within the overall scope
HS	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).			No direct correlation to Calif. But seems within the overall scope
HS	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.			This standard here at best will include only linear and quadratic functions, and their variants with absolute values.
HS	A-REI-12. Graph the solutions to a linear inequality in two variables as a halfplane (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.	**6**	Students graph a linear equation and compute the *x* - and *y* - intercepts (e.g., graph 2*x* + 6*y* = 4). They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by 2*x* + 6*y* < 4).	

Strand	Common Core Standards (CCS)	Strand	California Standards (CS)	Comments
		Grade 8	**Algebra 1**	
HS	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).	**17**	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.	
HS	F-IF-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.	**21**	Students graph quadratic functions and know that their roots are the *x* -intercepts.	
HS		**24**	Students use and know simple aspects of a logical argument:	
HS		**24.1**	Students explain the difference between inductive and deductive reasoning and identify and provide examples of each.	
HS		**24.2**	Students identify the hypothesis and conclusion in logical deduction.	
HS		**24.3**	Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion.	
HS		**25**	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:	
HS		**25.1**	Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions.	
		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.	