ADDITIONAL 15%

	SOURCE: SCOE "Consider" CA Math Standard/ SCOE "Additional Consideration"/ Common Core Standard	SUGGESTED ACTION
Kind.	CA Number Sense 3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones and tens places:	No Addition
	CA Measurement and Geometry 1.3 Name the days of the week.	No Addition
1st Grade	CA Number Sense 3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, and hundreds places	No Addition
	CA Number Sense 3.1 Make reasonable estimates when comparing larger or smaller numbers.	1.NBT.3.5 Make reasonable estimates when comparing larger or smaller numbers.
2nd Grade	CA Number Sense 6.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places:	No Addition
	CA Number Sense 6.1 Recognize when an estimate is reasonable in measurements (e.g., closest inch).	Add: 2.NBT.4.5 Make reasonable estimates when comparing larger or smaller numbers.
	SCOE Additional Con. 1: By way of transitioning from addition and subtraction to multiplication and division, consider using some of the language in CA NS 3.1 and 3.2 to lay a foundation for the more formal introduction of multiplication and division in 3rd. For example: NS 3.1 (Use repeated addition, arrays, and counting by multiples to do multiplication) becomes: Use repeated addition and counting by multiples to demonstrate multiplication. NS 3.2 (Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division) becomes: Use repeated subtraction and equal group sharing to demonstrate division.	No Addition
	SCOE Additional Con. 2: Consider adding some language from AF 1.1 (Use the commutative and associative rules to simplify mental calculations and to check results) to NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations, specifically commutative and associative.	No Addition

3rd Grade	CA Number Sense 1.5 Use expanded notation to represent numbers (e.g., 3,206 = 3,000 + 200 + 6).	3.NBT.1.5 Understand that the four digits of a four-digit number represent amounts of thousands, hundreds, tens, and ones; e.g. 3,706 = 3 thousands, 7 hundreds, 0 tens, and 6 ones
	CA Number Sense 2.6 Understand the special properties of 0 and 1 in multiplication and division.	No Addition
	CC.3.NF.3a Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	Add: Recognize that equivalences are only valid when the two fractions refer to the same whole.
4th Grade	SCOE Additional Con. 1: At the end of 4.OA.3 add "and explain why a rounded solution is appropriate."	No Addition
	SCOE Additional Con. 2: Add to the e.g. section of 4.NF.7 "or number line"	No Addition
	SCOE Additional Con. 3: Consider adding a 4.G.4 that uses language from CA MG 3.5, 3.7, and 3.8 about definitions about angles, triangles, and quadrilaterals.	No Addition
5th Grade	CC.5.G.3: Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	Add Footnote: Distinguish between rectangles, parallelograms and trapezoids.
	CA Number Sense 1.4 Determine the prime factors of all numbers through 50 and write the numbers as the product of their prime factors by using exponents to show multiples of a factor (e.g., 24 = 2 x 2 x 2 x 3 = 2^3 x 3).	Add 5.OA.2.5 Express a whole number in the range 2-50 as a product of its prime factors using exponents. For example, find the prime factors of 24 and express 24 as 2^3 x 3
7th Grade	CA Measurement and Geometry 3.6 Identify elements of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect).	No Addition
	CC.8.NS.1: Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	Add as 7.NS.4.a

	CC.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., π^2). *For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	Add as 7.NS.4.a
	CC.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.	Add as 7.EE.5.a
	CC.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.*	Add as 7.EE.5.b
	CC.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.	Add as 7.EE.5.c

Algebra	CA Algebra 2 1.0 : Students solve equations and inequalities involving absolute value.	Add A-REI.3.5: Solve one-variable equations and inequalities involving absolute value, graphing the solutions and interpreting them in context.
		Add A-REI.4.5 Solve quadratic inequalities in one variable.
	CA Algebra 2 11.0 : Students prove simple laws of logarithms. Algebra 2 13.0 : Students use the definition of logarithms to translate between logarithms in any base.	Add A-SSE 3e: Use the definition of logarithms to translate between logarithms in any base. and A-SSE 3d: Understand and use the properties of logarithms to simplify logarithmic numeric expressions and to identify their approximate values
	CA Algebra 1 11.0 : Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.	Add A.SSE.2.a. : Use the distributive property to express a sum of terms with a common factor as a multiple of a sum of terms with no common factor. For example, express xy^2 + x^2y as xy (y + x). and A.SSE.2.b. : Use the properties of operations to express a product of a sum of terms as a sum of products. For example, use the properties of operations to express (x + 5)(3 - x + c) as -x^2 + cx - 2x + 5c + 15.

Function	CA Trigonometry 5.0 : Students know the definitions of the tangent and cotangent functions and can graph them. CA Trigonometry 6.0 : Students know the definitions of the secant and cosecant functions and can graph them.	Add footnote to F-TF.2 and F-TF.3: This includes all six basic trigonometric functions
		Add F-LE.6 Interpret the parameters in a sinusoidal function in terms of a context.
	CA Trigonometry 11.0 : Students demonstrate an understanding of half-angle and double-angle formulas for sines and cosines and can use those formulas to prove and/or simplify other trigonometric identities.	Add F-TF 10: Prove the half angle and double angle identities for sine and cosine and use them to solve problems.
	CA Trigonometry 8.0 : Students know the definitions of the inverse trigonometric functions and can graph the functions. CA Trigonometry 9.0 : Students compute, by hand, the values of the trigonometric functions and the inverse trigonometric functions at various standard points.	Add F-TF.6.5: Define inverse sine, inverse cosine, and inverse tangent functions as the inverse functions to appropriately restricted sine, cosine, and tangent functions; give values for these functions.
	CA Trigonometry 1.0: Students understand the notion of angle and how to measure it, in both degrees and radians. They can convert between degrees and radians.	Add FTF.1.5: Convert between degrees and radians.
	CA Math Analysis 7.0: Students demonstrate an understanding of functions and equations defined parametrically and can graph them.	Add F.IF. 11: Students demonstrate an understanding of functions and equations defined parametrically and can graph them.
	CA Algebra 2 24.0: Students solve problems involving functional concepts, such as composition, defining the inverse function and performing arithmetic operations on functions.	Add FBF.3.5: Combine standard function types using arithmetic operations and composition. Determine domain.
		Add F-IF 7 f. Identify expressions involving a function as distances in the plane. For example, if a and b are in the domain of f, then 2|f(b)| and |f(b)-f(a)| can be viewed as vertical distances.
		Add F-IF 2.5 Given a function defined by a single variable expression, describe the set of all real values that result in a real value when substituted for the variable in the expression.
		Add F-LE 7: Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity.

Geometry	CA Geometry 6.0 : Students know and are able to use the triangle inequality theorem.	Add G.CO.10.5. Know that in a triangle, angles opposite longer sides are larger, sides opposite larger angles are longer, and the sum of any two side lengths is greater than the remaining side length (Triangle Inequality); apply these relationships to solve real-world and mathematical problems.
	CA Geometry 20.0 : Students know and are able to use angle and side relationships in problems with special right triangles, such as 30°, 60°, and 90° triangles and 45°, 45°, and 90° triangles.	Add G.SRT8.5 Derive and use the trigonometric ratios for special right triangles (30, 60, 90) and (45, 45, 90 triangles)
	CA Geometry 11.0 : Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.	Add G.MD.5 Know that the effect of a scale factor k on length, area, and volume is to multiply each by k, k^2, and k^3, respectively; determine length, are, and volume measures using scale factors. *
	CA Trigonometry 15.0 : Students are familiar with polar coordinates. In particular, they can determine polar coordinates of a point given in rectangular coordinates and vice versa. CA Trigonometry 16.0 : Students represent equations given in rectangular coordinates in terms of polar coordinates. CA Math Analysis 1.0: Students are familiar with, and can apply, polar coordinates and vectors in the plane. In particular, they can translate between polar and rectangular coordinates and can interpret polar coordinates and vectors graphically.	Add to G: Graph polar coordinates and curves. Convert between polar and rectangular coordinate systems.
	CA Algebra 2 16.0: Students demonstrate and explain how the geometry of the graph of a conic section (e.g., asymptotes, foci, eccentricity) depends on the coefficients of the quadratic equation representing it. CA Algebra 2 17.0: Given a quadratic equation of the form $ax^2 + by^2 + cx + dy + e = 0$, students can use the method for completing the square to put the equation into standard form and can recognize whether the graph of the equation is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation. CA Math Analysis 5.0 : Students are familiar with conic sections, both analytically and geometrically:	Add to G: Given a geometric description of a conic section, derive a quadratic equation representing it. and Given a quadratic equation of the form $ax2 + by2 + cx + dy + e = 0$, use the method for completing the square to put the equation into standard form; identify whether the graph of the equation is a circle, ellipse, parabola, or hyperbola, and graph the equation.

Practice	CA Algebra 2 21.0: Students apply the method of mathematical induction to prove general statements about the positive integers. CA Geometry 2.0 : Students write geometric proofs, including proofs by contradiction. CA Math Analysis 3.0: Students can give proofs of various formulas by using the technique of mathematical induction.	CC Standard for Mathematical Practice 3: Construct viable arguments and critique the reasoning of others: Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments. **Add: Students build proofs by induction and proofs by contradiction.**

8th GRADE ALGEBRA

1. CC Standards for Mathematical Practice
2. CC8 Standards
3. CC High School Standards as follows:

CC.NRN.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 $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.*
CC.NRN.2:	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
CC.NQ.2:	Define appropriate quantities for the purpose of descriptive modeling.
CC.ASSE.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.*
CC.ASSE.2:	Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*
CC.ASSE.3a:	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.
CC.ASSE.3b:	b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
CC.ACED.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.* (Limit to linear and quadratic.)
CC.ACED.2:	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (Limit to linear and quadratic.)
CC.ACED.3:	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* (Limit to linear and quadratic.)
CC.ACED.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.* (Limit to linear and quadratic.)

CC.REI.3:	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
CC.REI.4a, b:	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.
CC.REI.6:	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
CC.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).
CC.FIF.4:	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*★ (Limit to linear and quadratic.)
CC.FIF.5:	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*★ (Limit to linear and quadratic.)
CC.FIF.7a:	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.
CC.FIF.8a:	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
CC.FBF.1a:	Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (Limit to linear and quadratic.)
CC.FBF.3:	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. ˆ (Limit to linear and quadratic.)
CC.FLE.5:	Interpret the parameters in a linear, quadratic, or exponential function in terms of a context. (Limit to linear.)