

## Pre-Algebra Curriculum Map

California Mathematics Standards: Number Sense (NS), Algebra and Functions (AF), Measurement and Geometry (MG), Statistics, Data Analysis, and Probability (SDP). Mathematical Reasoning Standards (MR) are woven throughout the curriculum and are not specifically stated here.

The sequence of topics that follows is intended as a general outline, and is subject to change, based on the instructional needs of the class and other circumstances as they arise. The Standards and textbook references are also intended as guidelines, and some variation will likely occur.

In addition to the textbook listed, teachers will use materials from other resources as supplements. These resources include, but are not limited to, books from the *Navigation Series* from the National Council of Teachers of Mathematics, *Connected Mathematics Project*, MARS tasks, and Problems of the Month.

Month	California State Standards	Textbook Reference
August	<b>Introduction &amp; Problem Solving</b>	Various
September	<p><b><u>Algebra: Integers</u></b></p> <p>AF 1.1 Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A).</p> <p>AF 1.2 Use the correct order of operations to evaluate algebraic expressions such as <math>3(2x + 5)^2</math>.</p> <p>AF 1.3 Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used.</p> <p>AF 1.4 Use algebraic terminology (e.g., variable, equation, term, coefficient, inequality, expression, constant) correctly.</p> <p>AF 1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.</p> <p>NS 1.2 Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.</p> <p>NS 2.5 Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers.</p>	Chapter 1
October	<p><b><u>Algebra: Rational Numbers</u></b></p> <p>AF 1.1 Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A).</p> <p>AF 2.1 Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents.</p> <p>MG 1.3 Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.</p> <p>NS 1.1 Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.</p> <p>NS 1.2 Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.</p> <p>NS 1.3 Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.</p> <p>NS 1.5 Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions.</p> <p>NS 2.1 Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.</p> <p>NS 2.2 Add and subtract fractions by using factoring to find common denominators.</p>	Chapter 2

Month	California State Standards	Textbook Reference
November	<p><b><u>Real Numbers &amp; the Pythagorean Theorem</u></b></p> <p>MG 3.2 Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections.</p> <p>MG 3.3 Know and understand the Pythagorean Theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the Pythagorean Theorem by direct measurement.</p> <p>NS 1.2 Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.</p> <p>NS 1.4 Differentiate between rational and irrational numbers.</p> <p>NS 2.4 Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why.</p>	Chapter 3
December <b>*Winter Break</b>  January	<p><b><u>Proportions &amp; Percents</u></b></p> <p>AF 3.4 Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities.</p> <p>AF 4.2 Solve multi step problems involving rate, average speed, distance, and time or a direct variation.</p> <p>MG 1.1 Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters).</p> <p>MG 1.2 Construct and read drawings and models made to scale.</p> <p>MG 1.3 Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.</p> <p>MG 2.4 Relate the changes in measurement with a change of scale to the units used (e.g., square inches, cubic feet) and to conversions between units (1 square foot = 144 square inches or <math>[1 \text{ ft}^2] = [144 \text{ in}^2]</math>, 1 cubic inch is approximately 16.38 cubic centimeters or <math>[1 \text{ in}^3] = [16.38 \text{ cm}^3]</math>).</p> <p>NS 1.1 Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.</p> <p>NS 1.3 Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.</p> <p>NS 1.6 Calculate the percentage of increases and decreases of a quantity.</p> <p>NS 1.7 Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest.</p>	Chapter 4  Chapter 5
February  <b>*Winter Recess</b>	<p><b><u>Statistics</u></b></p> <p>SDP1.1 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.</p> <p>SDP1.2 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).</p> <p>SDP1.3 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.</p>	Chapter 11

Month	California State Standards	Textbook Reference
February	<b><u>Geometry</u></b>	Chapter 6
March  <b>*MARS Test</b>	AF 1.1 Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A). AF 4.2 Solve multi step problems involving rate, average speed, distance, and time or a direct variation. MG 2.1 Use formulas routinely for finding the perimeter and area of basic two-dimensional figures and the surface area and volume of basic three-dimensional figures, including rectangles, parallelograms, trapezoids, squares, triangles, circles, prisms, and cylinders. MG 2.2 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. MG 2.3 Compute the length of the perimeter, the surface area of the faces, and the volume of a three-dimensional object built from rectangular solids. Understand that when the lengths of all dimensions are multiplied by a scale factor, the surface area is multiplied by the square of the scale factor and the volume is multiplied by the cube of the scale factor. MG 3.1 Identify and construct basic elements of geometric figures (e.g., altitudes, midpoints, diagonals, angle bisectors, and perpendicular bisectors; central angles, radii, diameters, and chords of circles) by using a compass and straightedge. MG 3.2 Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections. MG 3.4 Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures. MG 3.5 Construct two-dimensional patterns for three-dimensional models, such as cylinders, prisms, and cones. MG 3.6 Identify elements of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect). NS 1.3 Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.	Chapter 7
April  <b>*Spring Break</b>	<b><u>Equations and Inequalities</u></b> AF 1.1 Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A). AF 1.3 Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used. AF 1.4 Use algebraic terminology (e.g., variable, equation, term, coefficient, inequality, expression, constant) correctly. AF 4.1 Solve two-step linear equations and inequalities in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results.	Chapter 8

Month	California State Standards	Textbook Reference
May  <b>*Star Test</b>	<p><b><u>Linear and Nonlinear Functions</u></b></p> <p>AF 1.1 Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A).</p> <p>AF 1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.</p> <p>AF 2.1 Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents.</p> <p>AF 2.2 Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent.</p> <p>AF 3.1 Graph functions of the form <math>y = nx^2</math> and <math>y = nx^3</math> and use in solving problems.</p> <p>AF 3.2 Plot the values from the volumes of three-dimensional shapes for various values of the edge lengths (e.g., cubes with varying edge lengths or a triangle prism with a fixed height and an equilateral triangle base of varying lengths).</p> <p>AF 3.3 Graph linear functions, noting that the vertical change (change in <math>y</math>- value) per unit of horizontal change (change in <math>x</math>- value) is always the same and know that the ratio ("rise over run") is called the slope of a graph.</p> <p>AF 3.4 Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities.</p> <p>AF 4.2 Solve multi step problems involving rate, average speed, distance, and time or a direct variation.</p> <p>NS 2.3 Multiply, divide, and simplify rational numbers by using exponent rules.</p>	Chapter 9  Chapter 10
June	<b>Review &amp; Final Exam</b>	