

California Common Core State Standards

Introduction to the Mathematics Administrator Snapshot

OVERVIEW

The Common Core State Standards (CCSS) define what students should understand and be able to do in the study of mathematics. Students who master the CCSS for mathematics will be prepared for college-level courses and possess the skills necessary for success in today's workforce.

There are two types of Mathematical Standards

- Mathematical Practices - describe a set of skills and processes that all students should develop as part of their study of mathematics
- Content Standards - the mathematics students are expected to learn

The Mathematical Practices are the same for every grade level and high school conceptual cluster. The Content Standards differ from year to year.

The Mathematical Practices are similar to California's idea of Balanced Mathematics for developing mathematics proficiency in students. In California there are three components: Computational and Procedural Skills, Conceptual Understanding and Problem Solving. There are eight Mathematical Practices. These are listed below with short, bulleted descriptions.

1 Make sense of problems and persevere in solving them

- Find meaning in problems
- Analyze, conjecture and plan solution pathways
- Verify answers
- Ask themselves the question: "Does this make sense?"

2 Reason abstractly and quantitatively

- Make sense of quantities and their relationships in problems
- Create coherent representations of problems

3 Construct viable arguments and critique the reasoning of others

- Understand and use information to construct arguments
- Make and explore the truth of conjectures
- Justify conclusions and respond to arguments of others.

4 Model with mathematics

- Apply mathematics to problems in everyday life
- Identify quantities in a practical situation
- Interpret results in the context of the situation and reflect on whether the results make sense

5 Use appropriate tools strategically

- Consider the available tools when solving problems
- Are familiar with tools appropriate for grade or course (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer programs, digital content located on a website, and other technological tools)

6 Attend to precision

- Communicate precisely to others
- Use clear definitions, state the meaning of symbols and are careful about specifying units of measure and labeling axes
- Calculate accurately and efficiently

7 Look for and make use of structure

- Discern patterns and structures
- Can step back for an overview and shift perspective
- See complicated things as single objects or as being composed of several objects

8 Look for and express regularity in repeated reasoning

- Notice if calculations are repeated and look both for general methods and shortcuts
- In solving problems, maintain oversight of the process while attending to detail
- Evaluate the reasonableness of their immediate results

The Content Standards are organized by domain. Under each domain is a set of clusters that are groups of related standards. Each grade K-8 has either four or five domains. Following is a chart of the K-8 domains.

Domains K-8								
Counting & Cardinality						Ratios & Proportional Relationships		
Operations and Algebraic Thinking					The Number System			
Number and Operations in Base Ten					Expressions and Equations			
			Number and Operations - Fractions					Functions
Measurement and Data								
Geometry					Geometry			
					Statistics and Probability			
K	1	2	3	4	5	6	7	8

The following section is a summary snapshot of the changes highlighted in the Common Core State Standards (CCSS). The left column represents topics new or highlighted in the CCSS and the right column represents topics that have been moved to another grade level or eliminated.

While not an exhaustive list, this chart should help familiarize you with many of the CCSS and allow you to communicate with teachers about their grade level content.

Common Core Standards for California Mathematics Snapshot for Administrators

Grade	What standards are new or highlighted at this grade level?	California State Standards that have been moved or are no longer included?
K	<ul style="list-style-type: none"> • Count to 100 by ones and tens (<i>Counting and Cardinality: 1</i>) • Write numbers from 0-20 (<i>Counting and Cardinality: 3</i>) • Explicit standard for one-to-one correspondence (<i>Counting and Cardinality: 4a</i>) • Knowing that the last number counted is the total (<i>Counting and Cardinality: 4b</i>) 	<p><i>Moved to Grade 1</i></p> <ul style="list-style-type: none"> • <i>Time (telling and writing)</i> • <i>Data Collection and basic graphing</i> <p>Statistics and Probability standards</p>

	<ul style="list-style-type: none"> • Compose and decompose numbers from 11-19 into ten ones and some further ones (<i>Number and Operations in Base Ten: 1</i>) • Decompose numbers less than or equal to 10 into pairs (<i>Operations and Algebraic Thinking: 3</i>) • Fluently add and subtract within 5 (<i>Operations and Algebraic Thinking: 5</i>) • Arrange and describe objects in space (<i>Geometry: 1</i>) • Identify shapes as either two- or three-dimensional (<i>Geometry: 3</i>) • Counting and Cardinality domain unique to Kindergarten 	
1	<ul style="list-style-type: none"> • Count to 120 starting at any number less than 120 (<i>Number and Operations in Base Ten: 1</i>) • Apply properties of operations as strategies to add and subtract (<i>Operations and Algebraic Thinking: 3</i>) • Partitioning circles and rectangles into two and four equal shares and describing those shares using fractional language (<i>Geometry: 3</i>) • Tell time to the nearest hour, half-hour using analog and digital clocks (<i>Measurement and Data: 3</i>) • Organize, represent and interpret data with up to three categories (<i>Measurement and Data: 4</i>) 	<p><i>Moved to Kindergarten</i></p> <ul style="list-style-type: none"> • <i>Identification of two- and three-dimensional shapes</i> • <i>Arrange and describe objects in space</i> • <i>Counting by 10s to 100</i> • <i>Moved to Grade 2</i> • <i>Knowing the value of coins</i> • <i>Commit addition and subtraction facts (to 20) to memory</i> • <i>Counting by 5s</i> • <i>Moved to Grade 3</i> • <i>Measuring and estimating liquid volume</i> <p>Statistics and Probability standards</p>
2	<ul style="list-style-type: none"> • Skip count by 5s, 10s and 100s within 1000 (<i>Number and Operations in Base Ten: 2</i>) • Commit to memory all sums of two one-digit numbers (<i>Operations and Algebraic Thinking: 2</i>) • Write an equation to express an even number as a sum of two equal addends (<i>Operations and Algebraic Thinking: 3</i>) • Estimating lengths using inches, feet, centimeters and meters (<i>Measurement and Data: 3</i>) • Measure to determine how much longer one object is than another (<i>Measurement and Data: 4</i>) • Represent whole-number sums and differences within 100 on a number line diagram (<i>Measurement and Data: 6</i>) • Know the value of coins and solve word problems involving combinations of coins and dollar bills (<i>Measurement and Data: 8</i>) 	<p><i>Moved to Grade 3</i></p> <ul style="list-style-type: none"> • <i>Commit the multiplication tables of 2s, 5s, and 10s to memory</i> • <i>Modeling and solving simple multiplication and division problems</i> • <i>Basic fraction concepts</i> • <i>Measurement concepts of elapsed time</i> <p>Statistics and Probability standards</p>
3	<ul style="list-style-type: none"> • Generalize place value understanding for multi-digit whole numbers (<i>Number and Operations in Base Ten: 1.1</i>) • Modeling and solving multiplication and division problems (<i>Operations and Algebraic Thinking: 3</i>) • Understand multiplication and division and the relationship between the two (<i>Operations and Algebraic Thinking: 5</i>) 	<p><i>Moved to Grade 4</i></p> <ul style="list-style-type: none"> • <i>Multi-digit multiplication and division beyond 100</i> • <i>Adding and subtracting fractions with like denominators</i> • <i>Using decimal notation for fractions</i> • <i>Work with angles as geometric shapes</i> <p><i>Moved to Grade 5</i></p>

	<ul style="list-style-type: none"> Apply properties including the distributive property as strategies to multiply and divide (<i>Operations and Algebraic Thinking: 5</i>) Fluently multiply and divide with numbers within 100 (<i>Operations and Algebraic Thinking: 7</i>) Know from memory all products of two one-digit numbers (<i>Operations and Algebraic Thinking: 7</i>) Developing an understanding of fractions as numbers (<i>Number and Operations-Fractions: 1</i>) Locating fractions on a number line: knowing that on a number line $\frac{1}{8}$ and another $\frac{1}{8}$ end at a spot identified as $\frac{2}{8}$ (<i>Number and Operations-Fractions: 2</i>) Understand elapsed time (<i>Measurement and Data: 1</i>) Measuring and estimating liquid volume (<i>Measurement and Data: 2</i>) Understand concepts of area measurement (<i>Measurement and Data: 5</i>) 	<ul style="list-style-type: none"> Unit conversions <p>Moved to Grade 7</p> <ul style="list-style-type: none"> Probability standards <p>Statistics and Probability standards</p>
4	<ul style="list-style-type: none"> Generalize place value understanding by knowing that a digit in one place represents ten times what it represents in the place to its right (<i>Number and Operations in Base Ten: 1</i>) Multi-digit multiplication and division beyond 100 (<i>Number and Operations in Base Ten: 5</i>) Generate number or shape patterns that follow a given rule (<i>Operations and Algebraic Thinking: 5</i>) Understanding addition and subtraction of fractions with like denominators (<i>Number and Operations-Fractions: 3b</i>) Multiply fractions by a whole number (<i>Number and Operations-Fractions: 4b</i>) Using decimal notation for fractions with denominators of 10 or 100 (<i>Number and Operations-Fractions: 6</i>) Know relative sizes of measurement units within one system including km, m, cm; kg, g; l, ml; hr, min, sec. (<i>Measurement and Data: 1</i>) Recognize angles as geometric shapes (<i>Measurement and Data: 5</i>) 	<p>Moved to Grade 5</p> <ul style="list-style-type: none"> Addition, subtraction and rounding of decimals Using the standard algorithm for multiplication Use of parentheses in numeric expressions Coordinate graphing <p>Moved to Grade 6</p> <ul style="list-style-type: none"> Concept of negative numbers Evaluating algebraic expressions and graphing linear functions Knowing mode, median and outliers Identifying the radius and diameter of a circle <p>Statistics and Probability standards Visualizing, describing and making models of geometric solids</p>
5	<ul style="list-style-type: none"> Read, write, compare and round decimals to the thousandths (<i>Number and Operations in Base Ten: 3</i>) Fluently multiply multi-digit whole numbers using the standard algorithm (<i>Number and Operations in Base Ten: 5</i>) Add, subtract, multiply and divide decimals to hundredths using models, drawings, strategies, properties (<i>Number and Operations in Base Ten: 7</i>) Use equivalent fractions as a strategy to add and subtract fractions with unlike denominators (<i>Number and Operations-Fractions: 1</i>) Interpret multiplication as scaling (<i>Number and Operations-Fractions: 5</i>) Solve real world problems involving multiplication and division of fractions and mixed numbers (<i>Number and Operations-Fractions: 6</i>) 	<p>Moved to Grade 6</p> <ul style="list-style-type: none"> Finding decimal and percent equivalents and computing a given percent of a whole number Understanding and computing positive integer powers of nonnegative integers Use a letter to represent an unknown number Derive and use the formula for area of a triangle Compute surface area <p>Statistics and Probability standards</p>

	<ul style="list-style-type: none"> • Use parentheses in numeric expressions (<i>Operations and Algebraic Thinking: 1</i>) • Write and interpret simple expressions without evaluating them (<i>Operations and Algebraic Thinking: 2</i>) • Graph points on the coordinate plane to solve real-world and mathematical problems (<i>Operations and Algebraic Thinking: 3</i>) • Convert among different-sized standards measurement units with a given measurement system (<i>Measurement and Data: 1</i>) • Identify properties of two-dimensional figures (<i>Geometry: 3</i>) 	
6	<ul style="list-style-type: none"> • Use ratios and rates to: <ul style="list-style-type: none"> ◦ Compare quantities within and between measurement systems (<i>Ratios and Proportional Relationships: 3</i>) ◦ Relate the change of scale in measurements with the change of scale to units used (<i>Ratios and Proportional Relationships: 3</i>) • Solve problems involving percent; finding the whole, when given a part and the percent (<i>Ratios and Proportional Relationships: 3c</i>) • Understand positive and negative numbers (<i>The Number System: 5</i>) • Work with all four quadrants is included in graphing concepts (<i>The Number System: 6</i>) • Absolute value concepts are developed and applied (<i>The Number System: 7</i>) • Add and subtract negative integers (<i>The Number System: 7.1</i>) • Write and evaluate expressions involving whole-number exponents (<i>Expressions and Equations: 1</i>) • Use a letter to represent an unknown number (<i>Expressions and Equations: 2a</i>) • Represent solutions of inequalities on number line diagrams (<i>Expressions and Equations: 8</i>) • Analyze the relationship between dependent and independent variables (<i>Expressions and Equations: 9</i>) • Use of composition and decomposition to find area of geometric shapes (<i>Geometry: 1</i>) • Draw polygons in the coordinate plane (<i>Geometry: 3</i>) • Compute surface area (<i>Geometry: 4</i>) • Know various forms of display for data sets (<i>Statistics and Probability: 4</i>) • 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 (<i>Statistics and Probability: 5c</i>) 	<p><i>Moved to Grade 5</i></p> <ul style="list-style-type: none"> • <i>Identifying properties of two-dimensional figures</i> <p><i>Moved to Grade 7</i></p> <ul style="list-style-type: none"> • <i>Use proportions to solve problems</i> • <i>Identify angles as vertical, adjacent, complementary or supplementary and provide descriptions of these terms</i> • <i>Use properties about supplementary and complementary angles and the sum of the angles of a triangle to solve problems</i> • <i>Draw triangles and quadrilaterals from given information</i> • <i>Sampling techniques</i> • <i>Theoretical and experimental probability</i> • <i>Understand the difference between independent and compound events</i> • <i>Determine the probability of compound events</i> • <i>Determine the likelihood of an event occurring</i> • <i>Use data to estimate the probability of future events</i> <p><i>Moved to Grade 8</i></p> <ul style="list-style-type: none"> • <i>Understand how the inclusion or exclusion of outliers affects measures of central tendency</i>
7	<ul style="list-style-type: none"> • Recognize and represent proportional relationships between quantities (<i>Ratios and Proportional Relationships: 2a</i>) • Identify unit rate in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships (<i>Ratios and Proportional Relationships: 2b</i>) • Represent proportional relationships by equations (<i>Ratios and Proportional Relationships: 2c</i>) • Explain what a point (x, y) on a graph of the proportional relationship means in terms 	<p><i>Moved to Grade 6</i></p> <ul style="list-style-type: none"> • <i>Solve problems using percents</i> • <i>Absolute value concepts are developed and applied</i> • <i>Represent solutions of inequalities on number line diagrams</i> • <i>Write and evaluate expressions using whole-number</i>

	<p>of the situation (<i>Ratios and Proportional Relationships: 2d</i>)</p> <ul style="list-style-type: none"> • Draw geometric shapes from given information (<i>Geometry: 2</i>) • Use facts about supplementary, complementary, vertical angles to solve simple equations for an unknown angle in a figure (<i>Geometry: 5</i>) • Find surface area and volume of cones and spheres (<i>Geometry: 6</i>) • Use sampling techniques to draw inferences about a population (<i>Statistics and Probability: 2</i>) • Determine the likelihood of an event occurring (<i>Statistics and Probability: 6</i>) • Use data to estimate the probability of future events (<i>Statistics and Probability: 6</i>) • Find theoretical and experimental probabilities (<i>Statistics and Probability: 7</i>) • Understand the difference between independent and compound events (<i>Statistics and Probability: 8</i>) • Determine the probability of compound events (<i>Statistics and Probability: 8</i>) 	<p><i>exponents</i></p> <ul style="list-style-type: none"> • Use a letter to represent an unknown number • Work with all four quadrants is included in graphing concepts • Analyze the relationship between dependent and independent variables • Use ratios and rates to compare quantities within and between measurement systems • Use ratios and rates to relate the change of scale in measurements with a change of scale to the units used • Use of composition and decomposition to find area of geometric shapes • Compute surface area • Draw polygons in the coordinate plane • Know various forms of display for data sets • 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><i>Moved to Grade 8</i></p> <ul style="list-style-type: none"> • Graph and interpret linear and nonlinear functions • Plot the values of quantities whose ratios are always the same. Fit a line to the plot and understand that the slope of the line equals the quantities. • Slope of a line • Radicals and integer exponents, including rules for working with exponents • Pythagorean Theorem • Congruency of geometric figures • Transformational geometry • Scientific notation <p><i>Moved to Algebra 1</i></p> <ul style="list-style-type: none"> • Graph functions of the form $y=nx^2$ and $y = nx^3$ <p>Plot the values from the volumes of three-dimensional shapes for various values of edge lengths Identify and construct basic elements of geometric figures by using compass and straight edge</p>
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