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# California Common Core State Standards for Mathematics

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Grade 4

California Common Core State Standards for Mathematics Grade 4		i-Ready Classroom Mathematics Lessons Grade 4
<b>Grade 4</b>		
<b>4.OA</b>	<b>Operations and Algebraic Thinking</b>	
	Use the four operations with whole numbers to solve problems.	
4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ 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.	<b>Lesson 6:</b> <i>Understand</i> Multiplication as a Comparison  <u><b>Supporting Content:</b></u> Lesson 7: Multiplication and Division in Word Problems <b>Math in Action:</b> pp. 214–221
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.	<b>Lesson 7:</b> Multiplication and Division in Word Problems  <u><b>Supporting Content:</b></u> Lesson 6: <i>Understand</i> Multiplication as a Comparison; Lesson 10: Model and Solve Multi-Step Problems; Lesson 28: Problems About Time and Money; Lesson 29: Problems About Length, Liquid Volume, Mass, and Weight <b>Math in Action:</b> pp. 214–221
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.	<b>Lesson 10:</b> Model and Solve Multi-Step Problems  <u><b>Supporting Content:</b></u> Lesson 28: Problems About Time and Money; Lesson 29: Problems About length, Liquid Volume, Mass, and Weight <b>Math in Action:</b> pp. 214–221

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	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.	<b>Lesson 8:</b> Multiples and Factors  <b>Supporting Content:</b> Lesson 9: Number and Shape Patterns <b>Math in Action:</b> pp. 214–221, 350–357
	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. <i>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 way.</i>	<b>Lesson 9:</b> Number and Shape Patterns
<b>4.NBT</b>	<b>Number and Operations in Base Ten</b>	
	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. <i>For example, recognize that <math>700 \div 70 = 10</math> by applying concepts of place value and division.</i>	<b>Lesson 1:</b> <i>Understand</i> Place Value  <b>Supporting Content:</b> Lesson 2: Compare Whole Numbers; Lesson 11: Multiply by One-Digit Numbers
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.	<b>Lesson 1:</b> <i>Understand</i> Place Value <b>Lesson 2:</b> Compare Whole Numbers  <b>Supporting Content:</b> <b>Math in Action:</b> pp. 92–99

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4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.	<b>Lesson 3:</b> Round Whole Numbers  <b>Supporting Content:</b> Lesson 4: Add Whole Numbers; Lesson 5: Subtract Whole Numbers; Lesson 11: Multiply by One-Digit Numbers <b>Math in Action:</b> pp. 92–99
	Use place value understanding and properties of operations to perform multi-digit arithmetic.	
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	<b>Lesson 4:</b> Add Whole Numbers <b>Lesson 5:</b> Subtract Whole Numbers  <b>Supporting Content:</b> Lesson 28: Problems About Time and Money; Lesson 29: Problems About Length, Liquid Volume, Mass, and Weight <b>Math in Action:</b> pp. 92–99, 214–221
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.	<b>Lesson 11:</b> Multiply by One-Digit Numbers <b>Lesson 12:</b> Multiply by Two-Digit Numbers  <b>Supporting Content:</b> Lesson 13: Use Multiplication to Convert Measurements; Lesson 14: Divide Three-Digit Numbers; Lesson 15: Divide Four-Digit Numbers; Lesson 16: Find Perimeter and Area; Lesson 28: Problems About Time and Money; Lesson 29: Problems About Length, Liquid Volume, Mass, and Weight <b>Math in Action:</b> pp. 350–357
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.	<b>Lesson 14:</b> Divide Three-Digit Numbers <b>Lesson 15:</b> Divide Four-Digit Numbers  <b>Supporting Content:</b> Lesson 10: Model and Solve Multi-Step Problems; Lesson 16: Find Perimeter and Area; Lesson 28: Problems About Time and Money; Lesson 29: Problems About Length, Liquid Volume, Mass, and Weight <b>Math in Action:</b> pp. 350–357

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<b>4.NF</b>	<b>Number and Operations—Fractions</b>	
	Extend understanding of fraction equivalence and ordering.	
4.NF.1	Explain why a fraction $a/b$ is equivalent to a fraction $(n \times a)/(n \times b)$ 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.	<b>Lesson 17:</b> <i>Understand</i> Equivalent Fractions  <b>Supporting Content:</b> Lesson 18: Compare Fractions; Lesson 25: Fractions as Tenths and Hundredths <b>Math in Action:</b> pp. 628–635
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.	<b>Lesson 18:</b> Compare Fractions  <b>Supporting Content:</b> <b>Math in Action:</b> pp. 628–635
	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 $1/b$ .	<b>Lesson 19:</b> <i>Understand</i> Fraction Addition and Subtraction <b>Lesson 20:</b> Add and Subtract Fractions <b>Lesson 21:</b> Add and Subtract Mixed Numbers  <b>Supporting Content:</b> Lesson 22: Add and Subtract Fractions in Line Plots; Lesson 29: Problems About Length, Liquid Volume, Mass, and Weight
4.NF.3.a	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	<b>Lesson 19:</b> <i>Understand</i> Fraction Addition and Subtraction  <b>Supporting Content:</b> Lesson 20: Add and Subtract Fractions; Lessons 21: Add and Subtract Mixed Numbers <b>Math in Action:</b> pp. 628–635

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4.NF.3.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. <i>Examples:</i> $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ ; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$ ; $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$ .	<b>Lesson 20:</b> Add and Subtract Fractions  <b>Supporting Content:</b> Lesson 21: Add and Subtract Mixed Numbers <b>Math in Action:</b> pp. 628–635
4.NF.3.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.	<b>Lesson 21:</b> Add and Subtract Mixed Numbers  <b>Supporting Content:</b> Lesson 22: Add and Subtract Fractions in Line Plots; Lesson 29: Problems About Length, Liquid Volume, Mass, and Weight <b>Math in Action:</b> pp. 628–635
4.NF.3.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.	<b>Lesson 20:</b> Add and Subtract Fractions  <b>Supporting Content:</b> Lesson 21: Add and Subtract Mixed Numbers; Lesson 22: Add and Subtract Fractions in Line Plots; Lesson 29: Problems About Length, Liquid Volume, Mass, and Weight <b>Math in Action:</b> pp. 628–635
4.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	
4.NF.4.a	Understand a fraction $a/b$ as a multiple of $1/b$ . <i>For example, use a visual fraction model to represent <math>\frac{5}{4}</math> as the product <math>5 \times (\frac{1}{4})</math>, recording the conclusion by the equation <math>\frac{5}{4} = 5 \times (\frac{1}{4})</math>.</i>	<b>Lesson 23:</b> <i>Understand</i> Fraction Multiplication  <b>Supporting Content:</b> Lesson 24: Multiply Fractions by Whole Numbers <b>Math in Action:</b> pp. 628–635
4.NF.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. <i>For example, use a visual fraction model to express <math>3 \times (\frac{2}{5})</math> as <math>6 \times (\frac{1}{5})</math>, recognizing this product as <math>\frac{6}{5}</math>. (In general, <math>n \times (a/b) = (n \times a)/b</math>.)</i>	<b>Lesson 23:</b> <i>Understand</i> Fraction Multiplication  <b>Supporting Content:</b> Lesson 24: Multiply Fractions by Whole Numbers <b>Math in Action:</b> pp. 628–635

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4.NF.4.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. <i>For example, if each person at a party will eat <math>\frac{3}{8}</math> 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?</i>	<b>Lesson 24:</b> Multiply Fractions by Whole Numbers  <b><u>Supporting Content:</u></b> <b>Math in Action:</b> pp. 628–635
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. <i>For example, express <math>\frac{3}{10}</math> as <math>\frac{30}{100}</math>, and add <math>\frac{3}{10} + \frac{4}{100} = \frac{34}{100}</math></i>	<b>Lesson 25:</b> Fractions as Tenths and Hundreths  <b><u>Supporting Content:</u></b> <b>Math in Action:</b> pp. 628–635
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite <math>0.62</math> as <math>\frac{62}{100}</math>; describe a length as <math>0.62</math> meters; locate <math>0.62</math> on a number line diagram.</i>	<b>Lesson 26:</b> Relate Decimals and Fractions  <b><u>Supporting Content:</u></b> <b>Math in Action:</b> pp. 628–635
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 the number line or another visual model.	<b>Lesson 27:</b> Compare Decimals  <b><u>Supporting Content:</u></b> <b>Math in Action:</b> pp. 628–635



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<b>4.MD</b>	<b>Measurement and Data</b>	
	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	
4.MD.1	<p>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.</p> <p><i>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), . . .</i></p>	<p><b>Lesson 13:</b> Use Multiplication to Convert Measurements</p> <p><b>Supporting Content:</b> Lesson 28: Problems About Time and Money; Lesson 29: Problems About Length, Liquid Volume, Mass, and Weight</p>
4.MD.2	<p>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.</p> <p>Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.</p>	<p><b>Lesson 28:</b> Problems About Time and Money <b>Lesson 29:</b> Problems About Length, Liquid Volume, Mass, and Weight</p>
4.MD.3	<p>Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.</p> <p><i>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.</i></p>	<p><b>Lesson 16:</b> Find Perimeter and Area</p> <p><b>Supporting Content:</b> <b>Math in Action:</b> pp. 350–357</p>



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	Represent and interpret data.	
4.MD.4	<p>Make a line plot to display a data set of measurements in fractions of a unit (<math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{8}</math>). Solve problems involving addition and subtraction of fractions by using information presented in line plots.</p> <p><i>For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection .</i></p>	<p><b>Lesson 22:</b> Add and Subtract Fractions in Line Plots</p> <p><b>Supporting Content:</b> <b>Math in Action:</b> pp. 628–635</p>
	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:	<p><b>Lesson 30:</b> Points, Lines, Rays, and Angles <b>Lesson 31:</b> Angles</p> <p><b>Supporting Content:</b> Lesson 32: Add and Subtract with Angles; Lesson 33: Classify Two-Dimensional Figures <b>Math in Action:</b> pp. 760–767</p>
4.MD.5.a	An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.	<p><b>Lesson 31:</b> Angles</p> <p><b>Supporting Content:</b> Lesson 32: Add and Subtract with Angles</p>
4.MD.5.b	An angle that turns through $n$ one-degree angles is said to have an angle measure of $n$ degrees.	<p><b>Lesson 31:</b> Angles</p> <p><b>Supporting Content:</b> Lesson 32: Add and Subtract with Angles</p>
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	<p><b>Lesson 31:</b> Angles</p> <p><b>Supporting Content:</b> <b>Math in Action:</b> pp. 760–767</p>

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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.	<b>Lesson 32:</b> Add and Subtract with Angles  <u><b>Supporting Content:</b></u> <b>Math in Action:</b> pp. 760–767
<b>4.G</b>	<b>Geometry</b>	
	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.	<b>Lesson 30:</b> Points, Lines, Rays, and Angles  <u><b>Supporting Content:</b></u> Lesson 33: Classify Two-Dimensional Figures <b>Math in Action:</b> pp. 760–767
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. (Two-dimensional shapes should include special triangles, e.g., equilateral, isosceles, scalene, and special quadrilaterals, e.g., rhombus, square, rectangle, parallelogram, trapezoid.)	<b>Lesson 33:</b> Classify Two-Dimensional Figures  <u><b>Supporting Content:</b></u> <b>Math in Action:</b> pp. 760–767
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.	<b>Lesson 34:</b> Symmetry  <u><b>Supporting Content:</b></u> <b>Math in Action:</b> pp. 760–767