

### Introduction

In the years prior to Grade 4, students gained an understanding of multiplication and division of whole numbers, generalized strategies for addition and subtraction to multi-digit numbers, developed understanding of fractions as numbers, and reasoned with shapes and their attributes. They used arrays and the concept of area to develop computational strategies for multiplication and division. Throughout Grade 4, students continue to develop their understanding of numbers. They generalize their understanding of place value to 1,000,000. Students extend their understanding of the four operations to include multiplicative comparative problems, operations with multi-digit numbers, and multiplying fractions by whole numbers. Students further develop their understanding of fractions to include addition of fractions with like denominators and comparison and ordering of fractions with either like numerators or like denominators. The geometry focus in Grade 4 is on reasoning about angle measurement and lines.

### Critical Areas of Instruction for Fourth Grade

**Critical Area 1: Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends.**

Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

**Critical Area 2: Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators and multiplication of fractions by whole numbers**

Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g.,  $15/9 = 5/3$ ), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

**Critical Area 3: Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.**

Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

Please reference the [California Mathematics Framework](#) for elaboration on the standards, critical areas, major and supporting clusters, and instructional practices.

### Connecting Standards for Mathematical Practice and Content

The Standards for Mathematical Practice apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. The standards for Mathematical Practice (MP) represent a picture of what it looks like for students to **do** mathematics, and to the extent possible, content instruction should include attention to appropriate practice standards. There are ample opportunities for students to engage in each practice in Fourth Grade; the table below offers some general examples of each practice in Grade 4.

Standards for Mathematical Practice	Example:
<p><b>MP1.</b> <i>Make sense of problems and persevere in solving them.</i></p>	<p>In grade four, students know that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. Students might use an equation strategy to solve the word problem. For example, students could solve the problem “Chris bought clothes for school. She bought 3 shirts for \$12 each and a skirt for \$15. How much money did Chris spend on her new school clothes?” with the equation <math>3 \times \\$12 + \\$15 = a</math>.</p> <p>Students may use visual models to help them conceptualize and solve problems. They may check their thinking by asking themselves, “Does this make sense?” They listen to the strategies of others and will try different approaches. They often will use another method to check their answers.</p>
<p><b>MP2.</b> <i>Reason abstractly and quantitatively.</i></p>	<p>Fourth graders recognize that a number represents a specific quantity. They connect the quantity to written symbols and create a logical representation of the problem at hand, considering both the appropriate units involved and the meaning of quantities. They extend this understanding from whole numbers to their work with fractions and decimals. Students write simple expressions, record calculations with numbers, and represent or round numbers using place value concepts. Students might use array or area drawings to demonstrate and explain <math>154 \times 6</math>, as 154 added six times, and so develop an understanding of the distributive property.</p> <p>For example, <math>154 \times 6 + (100 + 50 + 4) \times 6 = (100 \times 6) + (50 \times 6) + (4 \times 6) = 600 + 300 + 24 = 924</math>.</p> <p>Teachers might ask, “How do you know?” or “What is the relationship of the quantities?” to reinforce students’ reasoning and understanding.</p>
<p><b>MP3.</b> <i>Construct viable arguments and critique the reasoning of others.</i></p>	<p>Students may construct arguments using concrete referents, such as objects, pictures, drawings and actions. They practice their mathematical communication skills as they participate in mathematical discussions involving questions like “How did you get that?”, “Explain your thinking,” and “Why is that true?” They not only explain their own thinking, but listen to others’ explanations and ask questions. Students explain and defend their answers and solution strategies as they answer questions that require an explanation.</p>

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Standards for Mathematical Practice	Example:
<b>MP4.</b> <i>Model with mathematics</i>	<p>Students experiment with representing problem situations in multiple ways using numbers, words (mathematical language), drawings pictures, and objects. They might also represent a problem by acting it out or by creating charts, lists, graphs, or equations. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed. Students should be encouraged to answer questions, such as “What math drawing or diagram could you make and label to represent the problem?” or “What are some ways to represent the quantities?”</p> <p>Fourth graders evaluate their results in the context of the situation and reflect on whether the results make sense. For example, a student may use an area/array rectangle model to solve the following problem by extending from multiplication to division: A fourth grade teacher bought 4 new pencils boxes. She has 260 pencils. She wants to put the pencils in the boxes so that each box has the same number of pencils. How many pencils will there be in each box?</p>
<b>MP5.</b> <i>Use appropriate tools strategically.</i>	<p>Students consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use graph paper or a number line or drawings of dimes and pennies to represent and compare decimals or protractors to measure angles. They use other measurement tools to understand the relative size of units within a system and express measurements given in larger terms of smaller units. Students should be encouraged to answer questions such as, “Why was it helpful to use...?”</p>
<b>MP6.</b> <i>Attend to precision.</i>	<p>As fourth grade students develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and when they explain own reasoning. They are careful to specify units of measure and to state the meaning of the symbols they choose. For instance, they use appropriate labels when creating a line plot.</p>
<b>MP7.</b> <i>Look for and make use of structure.</i>	<p>Students look closely to discover a pattern or structure. For instance, students use properties of operations to explain calculations (partial products model). They generate number or shape patterns that follow a given rule. Teachers might ask, “What do you notice when...?” or “How do you know if something is a pattern?”</p>
<b>MP8.</b> <i>Look for and express regularity in repeating reasoning.</i>	<p>In grade four, students notice repetitive actions in computations to make generalizations. Students use models to explain calculations and understand how algorithms work. Students examine patterns and generate their own algorithms. For example, students use visual fraction models to write equivalent fractions. Students should be encouraged to answer questions, such as “What is happening in this situation?” or “What predictions or generalizations can this pattern support?”</p>

Adapted from CA Mathematics Framework 2015.

### Fourth Grade Content Emphasis by Cluster (PARCC/SBAC)

Not all of the content in a given grade is emphasized equally in the standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time they take to master, and/or their importance to future mathematics or the demands of college and career readiness. In addition, an intense focus on the most critical material at each grade allows depth in learning, which is carried out through the Standards for Mathematical Practice. To say that some things have greater emphasis is not to say that anything in the standards can safely be neglected in instruction. Neglecting materials will leave gaps in student skill and understandings and may leave students unprepared for the challenges of a later grade. The following table identifies the Major Clusters, Additional Clusters, and Supporting Clusters for this grade. Also, [Achieve the Core's Coherence Map](#) supports within and across grade level coherence.

Major Clusters (70%) Area of intensive focus where students need fluent understanding and application of the core.	Supporting Clusters (20%) Rethinking and linking areas where some material is being covered, but in a way that applies core understanding.	Additional Clusters (10%) Expose students to other subjects, though at a distinct level of depth and intensity.
<p><b>Operations and Algebraic Thinking</b></p> <ul style="list-style-type: none"> <li>Use the four operations with whole numbers to solve problems.</li> </ul> <p><b>Number and Operations in Base Ten</b></p> <ul style="list-style-type: none"> <li>Generalize place value understanding for multi-digit whole numbers.</li> <li>Use place value understanding and properties of operations to perform multi-digit arithmetic.</li> </ul> <p><b>Number and Operations- Fractions</b></p> <ul style="list-style-type: none"> <li>Extend understanding of fraction equivalence and ordering.</li> <li>Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.</li> <li>Understand decimal notation for fractions, and compare decimal fractions.</li> </ul>	<p><b>Operations and Algebraic Thinking</b></p> <ul style="list-style-type: none"> <li>Gain familiarity with factors and multiples.<sup>3</sup></li> </ul> <p><b>Measurement and Data</b></p> <ul style="list-style-type: none"> <li>Solve problems involving measurement and conversions of measurements from a larger unit to a smaller unit.</li> <li>Represent and interpret data.<sup>4</sup></li> </ul>	<p><b>Operations and Algebraic Thinking</b></p> <ul style="list-style-type: none"> <li>Generate and analyze patterns.</li> </ul> <p><b>Measurement and Data</b></p> <ul style="list-style-type: none"> <li>Geometric measurement: understand concepts of angles and measure angles.</li> </ul> <p><b>Geometry</b></p> <ul style="list-style-type: none"> <li>Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</li> </ul>

<sup>3</sup>Work in this cluster supports students' work with multi-digit arithmetic as well as their work with fraction equivalence. <sup>4</sup>The standards in this cluster require students to use a line plot to display measurements in fractions of a unit and to solve problems involving addition and subtraction of fractions, connecting it directly to the Number and Operations-Fractions clusters.

**Depth Opportunities: 4.NBT.5, 4.NBT.6; 4.NF.1, 4.NF.3, 4.NF.4**

**4<sup>th</sup> Grade Required Fluency** - 4.NBT.4 Add/Subtract within 1,000,000.

### FOURTH GRADE SCOPE AND SEQUENCE ~ YEAR AT A GLANCE

Quarter	Q1	Q2	Q3	Q4
<b>Big Ideas</b>	<b>Working with Place Value and Multiplication</b>	<b>Working with Division and Fractions</b>	<b>More Work with Fraction and Geometry</b>	<b>Working with Geometry &amp; Measurement</b>
<b>Domains</b>	<ul style="list-style-type: none"> <li>Operations &amp; Algebraic Thinking</li> <li>Numbers &amp; Operations in Base Ten</li> </ul>	<ul style="list-style-type: none"> <li>Numbers &amp; Operations – Fractions</li> <li>Operations &amp; Algebraic Thinking</li> </ul>	<ul style="list-style-type: none"> <li>Number &amp; Operations – Fractions</li> <li>Geometry</li> </ul>	<ul style="list-style-type: none"> <li>Geometry</li> <li>Measurement &amp; Data</li> </ul>
<b>Concepts</b>	Place Value and Operations with Whole Numbers (Ch.1)	Divide by 1-Digit Numbers (Ch. 4)	Add & Subtract Fractions (Ch. 7 – <b>Last 5</b> lessons)	Relative Sizes of Measurement Units (Ch. 12)
<b>Focus Standards</b>	<a href="#">4.NBT.1</a> , <a href="#">4.NBT.2</a> , <a href="#">4.NBT.3</a> , <a href="#">4.NBT.4*</a>	<a href="#">4.OA.3*</a> , <a href="#">4.NBT.6*</a>	<a href="#">4.NF.3c</a> , <a href="#">4.NF.3d*</a>	<a href="#">4.MD.1</a> , <a href="#">4.MD.2</a> , <a href="#">4.MD.4</a>
<b>Math Practices</b>	Multiply by 1-Digit Numbers & 2-Digit Numbers (Ch. 2 & 3)	Factors, Multiples, and Patterns (Ch. 5)	Multiply Fractions by Whole Numbers (Ch. 8)	Algebra: Perimeter and Area (Ch. 13)
	<a href="#">4.OA.1</a> , <a href="#">4.OA.2*</a> , <a href="#">4.OA.3*</a> , <a href="#">4.NBT.5*</a>	<a href="#">4.OA.4</a> , <a href="#">4.OA.5</a>	<a href="#">4.NF.4a</a> , <a href="#">4.NF.4b</a> , <a href="#">4.NF.4c</a>	<a href="#">4.MD.3</a>
	Can embed <a href="#">4.MD.3</a> with the use of area models	Fraction Equivalence and Comparison (Ch. 6)	Relate Fractions and Decimals (Ch. 9)	This Supports <a href="#">4.NBT.5*</a> & <a href="#">4.NBT.6*</a>
		<a href="#">4.NF.1*</a> , <a href="#">4.NF.2*</a>	<a href="#">4.NF.5</a> , <a href="#">4.NF.6</a> , <a href="#">4.NF.7</a> , <a href="#">4.MD.2</a>	Angles (Ch. 11)
		Add & Subtract Fractions (Ch. 7 – <b>First 5</b> lessons)	<a href="#">4.OA.5</a> , <a href="#">4.G.1</a> , <a href="#">4.G.2</a> , <a href="#">4.G.3</a>	<a href="#">4.MD.5a</a> , <a href="#">4.MD.5b</a> , <a href="#">4.MD.6</a> , <a href="#">4.MD.7</a>
		<a href="#">4.NF.3a</a> , <a href="#">4.NF.3b</a> , <a href="#">4.NF.3d</a>	Two Dimensional Figures (Ch. 10)	Getting Ready for 5 <sup>th</sup> Grade
<b>Standards Assessed on Interim</b>	All Q1 Standards Listed Above Are Assessed On Interim 1	All Q2 Standards Listed Above Are Assessed On Interim 2 Along with Recursive Standards: <a href="#">4.OA.2*</a> , <a href="#">4.NBT.4*</a> , <a href="#">4.NBT.5*</a>		
<b>Additional HMH Tools &amp; Resources</b>	Found in Quarter 1 Planner	Found in Quarter 2 Planner	Found in Quarter 3 Planner	Found in Quarter 4 Planner
<b>Common Assignment – HMH Performance Task</b>	HMH Performance Task <b>Visiting New York City</b> Chapter 3 – Multiplying 2-digit Numbers (4.NBT.5, 4.OA.3, 4.NBT.3)	HMH Performance Task <b>Helping Hands</b> Divide by 1-Digit Numbers Chapter 4 (4.OA.3, 4.NBT.6) <b>OR Building a House (AC Choice)</b> Critical Area – Place Value and Operations with Whole Numbers (4.NBT.4, 5, 6)	HMH Performance Task <b>Lending a Hand</b> Add and Subtract Fractions Chapter 7 (4.NF.3, 4.NF.3a-d) <b>OR Party Time! (AC Choice)</b> Critical Area – Fractions & Decimals (4.NF.3c, 4.NF.3d, 4.NF.4c, 4.NF.7)	HMH Performance Task <b>Community Building</b> Critical Area – Geometry, Measurement & Data (4.MD.3, 4.MD.6, 4.G.1, 4.G.2)

**Key:**

\* Denotes a recursive standard



Standards in Major Clusters



Standards in Supporting Clusters



Standards in Additional Clusters

Text Boxes provide suggestions for connections to build coherence across standards and further support the major clusters.