

Fourth Grade Standards

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These are the standards for what is taught throughout the year in Fourth Grade. It is the expectation that these skills will be reinforced after they have been taught.

Mathematical Practice Standards Taught Throughout the Year		
1. Make sense of problems and persevere in solving them	2. Reason abstractly and quantitatively	3. Construct viable arguments and critique the reasoning of others
<p>In Grade 4, 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. Fourth graders may use concrete objects or pictures 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>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 $3 \times \\$12 + \\$15 = a$.</p> <p>Fourth graders may use concrete objects</p>	<p>Fourth graders should 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 base 10 blocks or drawings to demonstrate 154×6, as 154 added six times, and develop an understanding of the distributive property. For example:</p> 154×6 $= (100 + 50 + 4) \times 6$ $= (100 \times 6) + (50 \times 6) + (4 \times 6)$ $= 600 + 300 + 24 = 924$	<p>In Grade 4, students may construct arguments using concrete referents, such as objects, pictures, and drawings. They explain their thinking and make connections between models and equations. They refine 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. Students explain and defend their answers and solution strategies as they answer questions that require an explanation. For example, “Vincent cuts 2 meters of string into 4 centimeter pieces for a craft. How many pieces of string does Vincent have? Explain your reasoning.” Students ask appropriate questions and they decide if explanations make sense.</p>



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Mathematical Practice Standards Taught Throughout the Year		
4. Model with mathematics	5. Use appropriate tools strategically	6. Attend to precision
<p>Students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, making a chart, list, or graph, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed. Fourth graders should evaluate their results in the context of the situation and reflect on whether the results make sense. For example, students may use money (i.e. dollars and coins) or base-10 blocks to solve the following problem: Elsie buys a drink for \$1.39 and a granola bar for \$0.89. How much change will she receive if she pays with a \$5 bill?</p>	<p>Fourth graders 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, a number line, or base 10 blocks to represent, compare, add, and subtract decimals to the hundredths. Students in fourth grade use protractors to measure angles. They use other measurement tools to understand the relative size of units within a given system and express measurements given in larger units in terms of smaller units.</p>	<p>As fourth graders develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and in their own reasoning. For instance, they may use graph paper or a number line to represent, compare, add, and subtract decimals to the hundredths. Students in fourth grade use protractors to measure angles. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, they use appropriate labels when creating a line plot.</p>



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Mathematical Practice Standards Taught Throughout the Year	
7. Look for and make use of structure	8. Look for and express regularity in repeated reasoning
In Grade 4, students look closely to discover a pattern or structure. For instance, students use properties of operations to explain calculations (partial products model). They relate representations of counting problems such as arrays and area models to the multiplication principle of counting. They generate number or shape patterns that follow a given rule using two-column tables.	Students in Grade 4 should notice repetitive actions in computation to make generalizations. Students use models to explain calculations and understand how algorithms work. They also use models to examine patterns and generate their own algorithms. For example, students use visual fraction models to write equivalent fractions.

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Standards taught during 1st Quarter		
Operations and Algebraic Thinking Use the four operations with whole numbers to solve problems. Gain familiarity with factors and multiples.	Number in Operations in Base Ten Generalize place value understanding for multi-digit whole numbers less than or equal to 1,000,000. Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers less than or equal to 1,000,000.	Measurement and Data Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
<p>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.</p> <p>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. See Table 2, page 96. Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)</p>	<p>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 by applying concepts of place value, multiplication, or division.</p> <p>4.NBT.2 Read and write multi-digit whole numbers using standard form, word form, and expanded form^G. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons. Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.</p> <p>4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place through 1,000,000.</p>	<p>4.MD.3 Develop efficient strategies to determine the area and perimeter of rectangles in real-world situations and mathematical problems. <i>For example, given the total area and one side length of a rectangle, solve for the unknown factor, and given two adjacent side lengths of a rectangle, find the perimeter.</i></p>



<p>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.</p>	<p>4.NBT.4 Fluently ^G add and subtract multi-digit whole numbers using a standard algorithm ^G.</p> <p>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.</p> <p>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.</p>	
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Standards taught during 2nd Quarter		
<p>Operations and Algebraic Thinking Use the four operations with whole numbers to solve problems. Generate and analyze patterns.</p>	<p>Number and Operation in Base Ten Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers less than or equal to 1,000,000.</p>	<p>Number and Operations- Fractions Extend understanding of fraction equivalence and ordering limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. (Fractions need not be simplified). Understand decimal notation for fractions, and compare decimal fractions limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.</p>
<p>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.</p> <p>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</i></p>	<p>4.NBT.4 Fluently ^G add and subtract multi-digit whole numbers using a standard algorithm ^G.</p>	<p>4.NF.1 Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{(n \times a)}{(n \times b)}$ 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.</p> <p>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 $\frac{1}{2}$. Recognize that comparisons are valid</p>



“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.

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.

4.NF.3 Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$.

- a.** Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- 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 ^G. Examples: $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$.
- 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.
- 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.

		<p>4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <p>a. Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. <i>For example, use a visual fraction model to represent $\frac{5}{4}$ as the product $5 \times (\frac{1}{4})$, recording the conclusion by the equation $\frac{5}{4} = 5 \times (\frac{1}{4})$ or $\frac{5}{4} = (\frac{1}{4}) + (\frac{1}{4}) + (\frac{1}{4}) + (\frac{1}{4}) + (\frac{1}{4})$.</i></p> <p>b. Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. <i>For example, use a visual fraction model to express $3 \times (\frac{2}{5})$ as $6 \times (\frac{1}{5})$, recognizing this product as $\frac{6}{5}$. (In general, $n \times (\frac{a}{b}) = (\frac{n \times a}{b})$.)</i></p> <p>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 $\frac{3}{8}$ 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</i></p>
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		<p><i>what two whole numbers does your answer lie?</i></p> <p>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 $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.</i> In general, students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators, but addition and subtraction with unlike denominators is not a requirement at this grade.</p> <p>4.NF.6 Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i></p> <p>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 a visual model.</p>
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Standards taught during 3rd Quarter		
Operations and Algebraic Thinking Use the four operations with whole numbers to solve problems.	Number and Operations in Base Ten Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers less than or equal to 1,000,000.	Measurement and Data Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. Represent and interpret data.
<p>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.</p>	<p>4.NBT.4 Fluently ^G add and subtract multi-digit whole numbers using a standard algorithm ^G.</p>	<p>4.MD.1 Know relative sizes of the metric measurement units within one system of units. Metric units include kilometer, meter, centimeter, and millimeter; kilogram and gram; and liter and milliliter. Express a larger measurement unit in terms of a smaller unit. Record measurement conversions in a two-column table. <i>For example, express the length of a 4-meter rope in centimeters. Because 1 meter is 100 times as long as a 1 centimeter, a two-column table of meters and centimeters includes the number pairs 1 and 100, 2 and 200, 3 and 300,...</i></p> <p>4.MD.2 Solve real-world problems involving money, time, and metric measurement.</p> <ul style="list-style-type: none"> a. Using models, add and subtract money and express the answer in decimal notation. b. Using number line diagrams ^G, clocks,



		<p>or other models, add and subtract intervals of time in hours and minutes.</p> <p>c. Add, subtract, and multiply whole numbers to solve metric measurement problems involving distances, liquid volumes, and masses of objects.</p> <p>4.MD.4 Display and interpret data in graphs (picture graphs, bar graphs, and line plots ^G) to solve problems using numbers and operations for this grade.</p>
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Standards taught during 4th Quarter			
Operations and Algebraic Thinking Use the four operations with whole numbers to solve problems.	Number and Operations in Base Ten Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers less than or equal to 1,000,000.	Measurement and Data Represent and interpret data. Geometric measurement: understand concepts of angle and measure angles.	Geometry Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
<p>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.</p>	<p>4.NBT.4 Fluently^G add and subtract multi-digit whole numbers using a standard algorithm^G.</p>	<p>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> <p>a. Understand 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> <p>b. Understand an angle that turns through n one-degree angles is said to have an angle measure</p>	<p>4.G.1 Draw points, lines, line segments, rays, angles (right, acute, and obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</p> <p>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.</p>

		<p>of n degrees.</p> <p>4.MD.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</p> <p>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.</p>	
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