

Grade 4 4.1. Core Content: Multi-digit multiplication	<i>(Numbers, Operations, Algebra)</i>
<p>Students learn basic multiplication facts and efficient procedures for multiplying two- and three-digit numbers. They explore the relationship between multiplication and division as they learn related division and multiplication facts in the same fact family. These skills, along with mental math and estimation, allow students to solve problems that call for multiplication. Building on an understanding of how multiplication and division relate to each other, students prepare to learn efficient procedures for division, which will be developed in fifth grade. Multiplication of whole numbers is not only a basic skill, it is also closely connected to Core Content in this grade level on area, and this connection reinforces understanding of both concepts. Multiplication is also central to students' study of many other topics in mathematics across the grades, including fractions, volume, and algebra.</p>	
Performance Expectations <i>Students are expected to:</i>	Units 1-9 Student Targets <u>Combine units 2 and 9 to facilitate instruction of 4.4.D</u> Instructed in listed units/*Assessment opportunities
4.1.A Quickly recall multiplication facts through 10 X 10 and the related division facts.	4.1.A I can quickly recall multiplication facts through 10 X 10 and the related division facts. *U1, *2, *9, *3, 4, *5, 8
4.1.B Identify factors and multiples of a number.	4.1.B I can identify factors and multiples of a number. *U1, 2, *9, 3, 4, 5, *8
4.1.C Represent multiplication of a two-digit number by a two-digit number with place value models.	4.1.C I can show how to multiply a two-digit number by a two-digit number with place value models. *U3, 8
4.1.D Multiply by 10, 100, and 1,000.	4.1.D I can multiply by 10, 100, and 1,000. *U1, *3, 4, *5, 8
4.1.E Compare the values represented by digits in whole numbers using place value.	4.1.E I can compare the values represented by digits in whole numbers using place value. *U5
4.1.F Fluently and accurately multiply up to a three-digit number by one- and two-digit numbers using the standard multiplication algorithm.	4.1.F I can fluently and accurately multiply up to a three-digit number by one- and two-digit numbers using the standard multiplication algorithm. *U8
4.1.G Mentally multiply two-digit numbers by numbers through 10 and by multiples of 10.	4.1.G I can mentally multiply two-digit numbers by numbers through 10 and by multiples of 10. *U3, 8
4.1.H Estimate products to approximate solutions to problems and determine reasonableness of answers.	4.1.H I can estimate products to find approximate solutions to problems, and I can determine if the answer is reasonable. *U9, 8

<p>4.1.I Solve single- and multi-step word problems involving multi-digit multiplication and verify the solutions.</p>	<p>4.1.I I can solve single- and multi-step word problems involving multi-digit multiplication. I can verify the solutions.</p> <p>U1, 2, 9, 3, 4, 8</p>
<p>4.1.J Solve single- and multi-step word problems involving division and verify the solutions.</p>	<p>4.1.J I can solve single- and multi-step word problems involving division. I can verify the solutions.</p> <p>U2, 9, *3, 4, 5, *8</p>

Grade 4 4.2. Core Content: Fractions, decimals, and mixed numbers	<i>(Numbers, Algebra)</i>
Students solidify and extend their understanding of fractions (including mixed numbers) to include decimals and the relationships between fractions and decimals. Students work with common factors and common multiples as preparation for learning procedures for fraction operations in grades five and six. When they are comfortable with and knowledgeable about fractions, students are likely to be successful with the challenging skills of learning how to add, subtract, multiply, and divide fractions.	
<i>Performance Expectations</i> <i>Students are expected to:</i>	<i>Student Targets</i>
4.2.A Represent decimals through hundredths with place value models, fraction equivalents, and the number line.	4.2.A I can represent decimals through hundredths with place value models, fraction equivalents, and the number line. *U6, *7
4.2.B Read, write, compare, and order decimals through hundredths.	4.2.B I can read, write, compare, and order decimals through hundredths. U6, *7
4.2.C Convert a mixed number to a fraction and vice versa, and visually represent the number.	4.2.C I can convert a mixed number to a fraction and vice versa. I can visually represent the number. U6, 7
4.2.D Convert a decimal to a fraction and vice versa, and visually represent the number.	4.2.D I can convert a decimal to a fraction and vice versa. I can visually represent the number. *U6
4.2.E Compare and order decimals and fractions (including mixed numbers) on the number line, lists, and the symbols $<$, $>$, or $=$.	4.2.E I can compare and order decimals and fractions (including mixed numbers) on the number line, lists, and the symbols $<$, $>$, or $=$. *U6
4.2.F Write a fraction equivalent to a given fraction.	4.2.F I can write a fraction equivalent to a given fraction. U6
4.2.G Simplify fractions using common factors.	4.2.G I can simplify fractions using common factors. U6
4.2.H Round fractions and decimals to the nearest whole number.	4.2.H I can round fractions and decimals to the nearest whole number. *U6
4.2.I Solve single- and multi-step word problems involving comparison of decimals and fractions (including mixed numbers), and verify the solutions.	4.2.I I can solve single- and multi-step word problems involving comparison of decimals and fractions (including mixed numbers). I can verify the solutions. U6

Grade 4 4.3. Core Content: Concept of area	<i>(Geometry/Measurement, Algebra)</i>
<p>Students learn how to find the area of a rectangle as a basis for later work with areas of other geometric figures. They select appropriate units, tools, and strategies, including formulas, and use them to solve problems involving perimeter and area. Solving such problems helps students develop spatial skills, which are critical for dealing with a wide range of geometric concepts. The study of area is closely connected to Core Content on multiplication, and connections between these concepts should be emphasized whenever possible.</p>	
Performance Expectations <i>Students are expected to:</i>	Student Targets
4.3.A Determine congruence of two-dimensional figures.	4.3.A I can explain whether two-dimensional figures are congruent. U4
4.3.B Determine the approximate area of a figure using square units.	4.3.B I can find the approximate area of a figure using square units. U4
4.3.C Determine the perimeter and area of a rectangle using formulas, and explain why the formulas work.	4.3.C I can figure out the perimeter and area of a rectangle using formulas, and explain why the formulas work. *U4
4.3.D Determine the areas of figures that can be broken down into rectangles.	4.3.D I can figure out the areas of figures that can be broken down into rectangles. *U4
4.3.E Demonstrate that rectangles with the same area can have different perimeters, and that rectangles with the same perimeter can have different areas.	4.3.E I can show that rectangles with the same area can have different perimeters, and that rectangles with the same perimeter can have different areas. U4
4.3.F Solve single- and multi-step word problems involving perimeters and areas of rectangles and verify the solutions.	4.3.F I can solve single- and multi-step word problems involving perimeters and areas of rectangles. I can verify the solutions. *U4

Grade 4 4.4. Additional Key Content	<i>(Geometry/Meaning, Algebra, Data/Statistics/Probability)</i>
<p>Students use coordinate grids to connect numbers to basic ideas in algebra and geometry. This connection between algebra and geometry runs throughout advanced mathematics and allows students to use tools from one branch of mathematics to solve problems related to another branch. Students also extend and reinforce their work with whole numbers and fractions to describe sets of data and find simple probabilities. Students combine measurement work with their developing ideas about multiplication and division as they do basic measurement conversions. They begin to use algebraic notation while solving problems in preparation for formalizing algebraic thinking in later grades.</p>	
<p>Performance Expectations <i>Students are expected to:</i></p>	<p>Student Targets <i>Combine units 2 and 9 to facilitate instruction of 4.4.D</i></p>
<p>4.4.A Represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols.</p>	<p>4.4.A I can represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols.</p> <p>*U9</p>
<p>4.4.B Solve single- and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.</p>	<p>4.4.B I can solve single- and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.</p> <p>*U4</p>
<p>4.4.C Estimate and determine elapsed time using a calendar, a digital clock, and an analog clock.</p>	<p>4.4.C I can estimate and determine elapsed time using a calendar, a digital clock, and an analog clock.</p> <p>U8</p>
<p>4.4.D Graph and identify points in the first quadrant of the coordinate plane using ordered pairs. <i>Intersperse elements of Unit 9 (data tables) into Unit 2 (Data...). This will provide an opportunity to apply this PE into an authentic context. Include the mathematical language and teach how to write an ordered pair.</i></p>	<p>4.4.D I can graph and identify points in the first quadrant of the coordinate plane using ordered pairs.</p> <p>U2, *9</p>
<p>4.4.E Determine the median, mode, and range of set of data and describe what each measure indicates about the data.</p>	<p>4.4.E I can determine the median, mode, and range of set of data and describe what each measure indicates about the data.</p> <p>* U2</p>
<p>4.4.F Describe and compare the likelihood of events.</p>	<p>4.4.F I can describe and compare the likelihood of events.</p> <p>* U2</p>
<p>4.4.G Determine a simple probability from a context that includes a picture.</p>	<p>4.4.G I can determine a simple probability from a context that includes a picture.</p> <p>U2</p>

4.4.H Display the results of probability experiments and interpret the results.	4.4.H I can display the results of probability experiments and interpret the results. U2
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Grade 4

4.5. Core Processes: Reasoning, problem solving, and communication

Students in grade four solve problems that extend their understanding of core mathematical concepts—such as multiplication of multi-digit numbers, area, probability, and the relationships between fractions and decimals—as they make strategic decisions that bring them to reasonable solutions. Students use pictures, symbols, or mathematical language to explain the reasoning behind their decisions and solutions. They further develop their problem-solving skills by making generalizations about the processes used and applying these generalizations to similar problem situations. These critical reasoning, problem-solving, and communication skills represent the kind of mathematical thinking that equips students to use the mathematics they know to solve a growing range of useful and important problems and to make decisions based on quantitative information.

Performance Expectations

Students are expected to:

Student Targets

4.5.A Determine the question(s) to be answered given a problem situation.	4.5.A I can determine the question(s) to be answered given a problem situation.
4.5.B Identify information that is given in a problem and decide whether it is essential or extraneous to the solution of the problem.	4.5.B I can identify information that is given in a problem and decide whether it is important or unnecessary to the solution of the problem.
4.5.C Identify missing information that is needed to solve a problem.	4.5.C I can identify missing information that is needed to solve a problem.
	U1, 3, *4, 6
4.5.D Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem.	4.5.D I can determine whether a problem to be solved is similar to previously solved problems. I can identify possible strategies for solving the problem.
	U1, 2, *3, 4, 5, 8
4.5.E Select and use one or more appropriate strategies to solve a problem and explain why that strategy was chosen.	4.5.E I can select and use one or more appropriate strategies to solve a problem and explain why that strategy was chosen.
	U1, 2, 3, 4, 5, 6, 7, 8
4.5.F Represent a problem situation using words, numbers, pictures, physical objects, or symbols.	4.5.F I can represent a problem situation using words, numbers, pictures, physical objects, or symbols.
	*U1, 2, *9, *3, *4, 5, 6, 7, *8
4.5.G Explain why a specific problem-solving strategy or procedure was used to determine a solution.	4.5.G I can explain why a specific problem-solving strategy or procedure was used to determine a solution.
	U1, 3, 4, 5, 6, 7, 8

<p>4.5.H Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.</p>	<p>4.5.H I can analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.</p> <p>U2, 4, *5</p>
<p>4.5.I Summarize mathematical information, draw conclusions, and explain reasoning.</p>	<p>4.5.I I can summarize mathematical information, draw conclusions, and explain reasoning.</p> <p>U1, 2, *4</p>
<p>4.5.J Make and test conjectures based on data (or information) collected from explorations and experiments.</p>	<p>4.5.J I can make and test conjectures based on data (or information) collected from explorations and experiments. (A conjecture is an opinion based on incomplete information.)</p> <p>U2</p>