

## Unit 6: Understand Addition, Subtraction, and Multiplication of Fractions

<b>Unit #:</b>	APSDO-00017493	<b>Duration:</b>	30.0 Day(s)	<b>Date(s)</b>	
----------------	----------------	------------------	-------------	----------------	--

<b>Team:</b>	Jodi Kryzanski (Author), Kerry Lurate, Ann Marie Castle, Kate Matos, Jonathan Moss, Michelle Gladue, Brian Kelly, Mary Labowsky, Laura McDonnell, Jill Polinsky, Nancy Wall, Lynne Zemaitis, Laurie Mone, Kimberly Bray
<b>Grade(s)</b>	4
<b>Subject(s)</b>	Mathematics

### Unit Focus

In this unit, students will learn how to add and subtract fractions and mixed numbers with common denominators. Students will convert between a mixed number and an improper fraction. With and without a model, students will decompose a fraction into a sum of fractions with the same denominator. They will learn to write multiples of unit fractions and find the product of a whole number and a unit fraction. Students will multiply a fraction by a whole number. Lastly, to solve word problems, they will add and subtract fractions with like denominators, as well as multiply fractions by a whole number using models or equations. Primary instructional materials for this unit include On Core and Everyday Mathematics.

### Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer
<p><b>Common Core</b> <i>Mathematics: 4</i></p> <ul style="list-style-type: none"> <li>• Understand a fraction <math>a/b</math> as a multiple of <math>1/b</math>. For example, use a visual fraction model to represent <math>5/4</math> as the product <math>5 \times (1/4)</math>, recording the conclusion by the equation <math>5/4 = 5 \times (1/4)</math>. <i>CCSS.MATH.CONTENT.4.NF.B.4A</i></li> <li>• Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</li> </ul>	<p><b>T1</b> (T12) Compose and decompose numbers to establish relationships and perform operations.</p> <p><b>T2</b> (T13) Move from one representation to another without changing the quantity.</p> <p><b>T3</b> (T14) Perform operations within the real and complex number system.</p> <p><b>T4</b> (T50) Based on an understanding of any problem, initiate a plan, execute it and evaluate the reasonableness of the solution.</p> <p><b>T5</b> (T51) Examine alternate methods to accurately and efficiently solve problems.</p> <p><b>T6</b> (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense.</p> <p><b>T7</b> (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts.</p>

<p><i>CCSS.MATH.CONTENT.4.NF.B.3A</i></p> <ul style="list-style-type: none"> <li>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. Examples: <math>3/8 = 1/8 + 1/8 + 1/8</math>; <math>3/8 = 1/8 + 2/8</math>; <math>2\ 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8</math>.</li> </ul> <p><i>CCSS.MATH.CONTENT.4.NF.B.3B</i></p> <ul style="list-style-type: none"> <li>Understand a multiple of <math>a/b</math> as a multiple of <math>1/b</math>, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express <math>3 \times (2/5)</math> as <math>6 \times (1/5)</math>, recognizing this product as <math>6/5</math>. (In general, <math>n \times (a/b) = (n \times a)/b</math>.)</li> </ul> <p><i>CCSS.MATH.CONTENT.4.NF.B.4B</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><i>CCSS.MATH.CONTENT.4.NF.B.3C</i></p> <ul style="list-style-type: none"> <li>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. For example, if each person at a party will eat <math>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?</li> </ul> <p><i>CCSS.MATH.CONTENT.4.NF.B.4C</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	Meaning	
	Understanding(s)	Essential Question(s)
	<p><b>U1</b> (U100) Objects and sets of objects can be given numerical descriptions.</p> <p><b>U2</b> (U102) The value of a number is quantified by the placement of its digits.</p> <p><b>U3</b> (U103) The same value can be represented in multiple ways.</p> <p><b>U4</b> (U502) Effective problem solvers identify and apply an appropriate model, tool, or strategy.</p> <p><b>U5</b> (U512) Mathematicians use diagrams, symbols, and terms to describe problems or situations</p> <p><b>U6</b> (U531) Models can distort or reveal patterns; therefore it is essential to recognize the appropriate representation.</p> <p><b>U7</b> (U561) Recognition of patterns and structures fosters efficiency in solving problems.</p>	<p><b>Q1</b> (Q100) How do I describe this object/number or set of objects/numbers?</p> <p><b>Q2</b> (Q102) What rule do I know OR what pattern can I recognize to help me make a prediction/solve this problem?</p> <p><b>Q3</b> (Q103) What is the value of this number/relationship and how can I represent it in different ways?</p> <p><b>Q4</b> (Q104) How do I use my number sense to perform operations?</p> <p><b>Q5</b> (Q503) What strategies/approaches are best for this problem?</p> <p><b>Q6</b> (Q514) What does the solution represent?</p> <p><b>Q7</b> (Q532) Which model best represents this problem?</p> <p><b>Q8</b> (Q533) How do I use the model to solve other problems?</p> <p><b>Q9</b> (Q561) How does understanding the pattern/structure help me solve the problem?</p>
Acquisition of Knowledge and Skill		
Knowledge	Skill(s)	
	<p><b>S1</b></p> <p>Decompose a fraction into a sum of fractions with the same denominator, in more than one way, with and without a model</p> <p><b>S2</b></p> <p>Add and subtract fractions with a common denominator</p> <p><b>S3</b></p> <p>Convert a mixed number into an improper fraction</p>	

<p><i>CCSS.MATH.CONTENT.4.NF.B.3D</i></p> <ul style="list-style-type: none"> <li>• Look for and express regularity in repeated reasoning. <i>CCSS.MATH.MP.8</i></li> <li>• Model with mathematics. <i>CCSS.MATH.MP.4</i></li> </ul>		<p><b>S4</b></p> <p>Convert an improper fraction into a mixed number</p> <p><b>S5</b></p> <p>Add and subtract mixed numbers with like denominators</p> <p><b>S6</b></p> <p>Solve word problems involving addition and subtraction of fractions with like denominators</p> <p><b>S7</b></p> <p>Make multiples of a unit fraction</p> <p><b>S8</b></p> <p>Write a fraction as a product of a whole number and a unit fraction</p> <p><b>S9</b></p> <p>Multiply a fraction or mixed number by a whole number</p> <p><b>S10</b></p> <p>Solve word problems involving multiplication of a fraction by a whole number by using models or equations</p>
---	--	--