



## Topic D

## Further Applications

## 5.NF.1, 5.NF.2

<b>Focus Standards:</b>	5.NF.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <i>For example, <math>2/3 + 5/4 = 8/12 + 15/12 = 23/12</math>. (In general, <math>a/b + c/d = (ad + bc)/bd</math>.)</i>
	5.NF.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. <i>For example, recognize an incorrect result <math>2/5 + 1/2 = 3/7</math>, by observing that <math>3/7 &lt; 1/2</math>.</i>
<b>Instructional Days:</b>	4	
<b>Coherence</b>	<b>-Links from:</b>	G4–M5 Fraction Equivalence, Ordering, and Operations
	<b>-Links to:</b>	G5–M1 Place Value and Decimal Fractions
		G5–M4 Multiplication and Division of Fractions and Decimal Fractions

Topic D opens with students estimating the value of expressions involving sums and differences with fractions. “Will your sum be less than or greater than one half? One? How do you know?” Though these conversations have been embedded within almost every Student Debrief up to this point, by setting aside an instructional day to dig deeply into logical arguments, students see that it is very easy to forget to make sense of numbers when calculating. This is really the theme of this topic—reasoning while using fractions.

In Lesson 14, students look for number relationships before calculating, for example, to use the associative property or part–whole understanding. Looking for relationships allows them to see shortcuts and connections that are so often bypassed in the rush to get the answer.

In Lesson 15, students solve multi-step word problems and actively assess the reasonableness of their answers. In Lesson 16, they explore part–whole relationships while solving a challenging problem: “One half of Nell’s money is equal to 2 thirds of Jennifer’s.” This lesson challenges the underlying assumption of all fraction arithmetic—that when adding and subtracting, fractions are always defined in relationship to the same whole amount. The beauty of this exploration is to see students grasp that  $\frac{1}{2}$  of one thing can be equivalent to  $\frac{2}{3}$  of another!

**A Teaching Sequence Toward Mastery of Further Applications**

**Objective 1:** Use fraction benchmark numbers to assess reasonableness of addition and subtraction equations.  
(Lesson 13)

**Objective 2:** Strategize to solve multi-term problems.  
(Lesson 14)

**Objective 3:** Solve multi-step word problems; assess reasonableness of solutions using benchmark numbers.  
(Lesson 15)

**Objective 4:** Explore part-to-whole relationships.  
(Lesson 16)