

## Core Focus

- Fractions: Adding common fractions and mixed numbers
- Division: Three- and four-digit dividends with one- and two-digit divisors

## Fractions

- Students gain a better understanding of fraction addition by visualizing it using area models and length models.
- These models help students identify which fractions should be rewritten to make the denominators the same, making it possible to add the fractions.

**6.3 Common fractions: Adding (related denominators)**

**Step In** These pizzas were left over after a party.

Choose two types of pizza to take home. What are the possible combinations you could choose?  
How much pizza is there in each of these combinations?

$\frac{1}{3} + \frac{1}{6} = \frac{\quad}{\quad}$        $\frac{5}{12} + \frac{1}{6} = \frac{\quad}{\quad}$        $\frac{1}{3} + \frac{5}{12} = \frac{\quad}{\quad}$

In this lesson, students use area models to help add fractions with different but related denominators.

- When adding fractions that have different, unrelated denominators, such as  $\frac{1}{3} + \frac{1}{4}$ , students think of multiples of each denominator to find a common denominator. In this case, each fraction could be rewritten as twelfths ( $\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$ ).

**6.4 Common fractions: Adding (unrelated denominators)**

**Step In** Shiro ran  $\frac{4}{5}$  of a mile on Saturday and  $\frac{2}{3}$  of a mile on Sunday.

What is your estimate for the total distance he ran?  
How did you form your estimate?  
How would you calculate the exact distance?  
What denominator do the two fractions have in common?  
Complete the diagram to find equivalent fractions that share a common denominator.  
Complete the equation to calculate the total distance he ran.

I will have to change both denominators to find a denominator they each have in common.

Shiro ran  $\frac{12}{15}$  of a mile. That is equivalent to  $1\frac{2}{5}$  miles, which is a little bit less than  $1\frac{1}{2}$  miles.

$\frac{\quad}{15} + \frac{\quad}{15} = \frac{\quad}{15}$

In this lesson, students describe strategies for adding common fractions with unrelated denominators.

## Ideas for Home

- Finding common denominators is a key skill when working with fractions. Say two numbers less than 12 (like 3 and 5) and ask your child to find a common multiple. For example, the multiples of 3 are 3, 6, 9, 12, 15, and the multiples for 5 are 5, 10, 15. A common multiple for 3 and 5 is 15.
- Help your child develop flexibility in thinking about fractions by talking about equivalent fractions in everyday activities. If a pizza is cut into eight equal slices and your child eats two slices, ask them to describe how much they ate ( $\frac{2}{8}$  or  $\frac{1}{4}$  of the pizza).

## Helpful videos

View this short one-minute video to see these ideas in action.

[www.bit.ly/OI\\_21](http://www.bit.ly/OI_21)

- Students think about strategies for adding fractions that are greater than one, like  $\frac{12}{5}$  (also written as  $2\frac{2}{5}$ ).
- Students choose whether to add the whole numbers and fractions separately, or to change the mixed numbers to improper fractions before adding.

**6.6 Common fractions: Adding mixed numbers (unrelated denominators)**

**Step In** How would you calculate the total amount of juice and water in this apple cake recipe?

Hugo changed the amounts to improper fractions to add. Charlotte used mixed numbers.

$\frac{5}{3} + \frac{5}{4} = \frac{\quad}{\quad}$        $1\frac{2}{3} + 1\frac{1}{4} = \frac{\quad}{\quad}$

**Apple Cake**


- $1\frac{2}{3}$  cups apple juice
- $1\frac{1}{4}$  cups water
- $1\frac{1}{3}$  cups oats
- $1\frac{1}{2}$  cups flour

What will Hugo and Charlotte need to do before they can add?

How should Hugo rewrite the fractions to add?  
What steps will he follow to calculate the total?

How should Charlotte rewrite the fractions to add?  
What steps could Charlotte follow to add the mixed numbers?  
What different ways could Charlotte use calculate the total?

How would you check that the total in Hugo's method is equivalent to the total in Charlotte's method?



- Depending on which strategy students use to add mixed numbers, the answer will be a mixed number or an improper fraction. Students see that both methods result in equivalent answers.

### Division

- In the following problem, students use what they know about the sharing strategy and the area model formula to solve a division problem. The key is to split the dividend to create numbers that are easy to divide.

**6.8 Division: Reviewing strategies**

**Step In** Cary bought a cell phone for \$369. He paid for it in three equal monthly payments.

Do you think his monthly payment is more or less than \$100?  
How did you decide?

How would you calculate the exact amount?  
Carmen follows these steps to calculate the exact amount.

**Step 1** She drew a rectangle to show the problem. The length of one side becomes the unknown value.

$3 \begin{array}{|c|c|} \hline & 369 \\ \hline \end{array}$

**Step 2** She split the rectangle into parts so that it was easier to divide by 3.

$3 \begin{array}{|c|c|c|} \hline 300 & 60 & 9 \\ \hline \end{array}$       P

**Step 3** She thought:

$3 \times 100 = 300$   
 $3 \times 20 = 60$   
 $3 \times 3 = 9$

$3 \begin{array}{|c|c|c|} \hline 300 & 60 & 9 \\ \hline \end{array}$       100 + 20 + 3

In this lesson, students can split blocks into three equal groups or use the area model to split three-digit dividends into parts that are easily divisible by one-digit divisors.

- Division involving remainders is reviewed, with the focus on how best to represent the remainder. For example, depending upon the context, the remainder might be broken up and shared, it might represent the actual answer, or it might be irrelevant to the answer and excluded. Students with a solid understanding of multiplication can adjust their interpretations of the remainder depending on the situation presented.
- Students review the steps to divide three-digit or four-digit numbers by a one-digit number. They then progress to dividing three- or four-digit numbers by any two-digit divisor.

### Ideas for Home

- Practice mental division problems at the grocery store. For example, for a six-pack of juice drinks that cost \$3.36, ask your child how much one drink would cost. Your child should think about each dollar as being 100 cents and respond, "Three hundred cents divided by six is 50 cents. Thirty-six cents divided by six is six cents. So one drink costs 56 cents."
- Create pairs of cards that have a division expression on one card and the matching quotient, or answer, on the other card. Use these cards to play games like *Memory*.