

Name \_\_\_\_\_

## Common Denominators

**Essential Question** How can you write a pair of fractions as fractions with a common denominator?



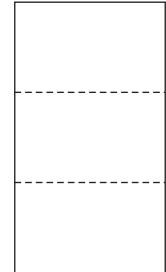
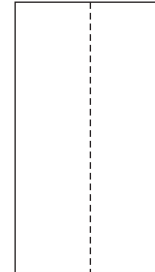
Number and Operations—  
Fractions—4.NF.A.1

**MATHEMATICAL PRACTICES**  
MP2, MP4, MP6

### Unlock the Problem



Martin has two rectangles that are the same size. One rectangle is cut into  $\frac{1}{2}$ -size parts. The other rectangle is cut into  $\frac{1}{3}$ -size parts. He wants to cut the rectangles so they have the same size parts. How can he cut each rectangle?



A **common denominator** is a common multiple of the denominators of two or more fractions. Fractions with common denominators represent wholes cut into the same number of parts.

 **Activity** Use paper folding and shading.

**Materials** ■ 2 sheets of paper

Find a common denominator for  $\frac{1}{2}$  and  $\frac{1}{3}$ .

**STEP 1**

Model the rectangle cut into  $\frac{1}{2}$ -size parts. Fold one sheet of paper in half. Draw a line on the fold.

**STEP 2**

Model the rectangle cut into  $\frac{1}{3}$ -size parts. Fold the other sheet of paper into thirds. Draw lines on the folds.

**STEP 3**

Fold each sheet of paper so that both sheets have the same number of parts. Draw lines on the folds. How many equal parts does each sheet of paper have? \_\_\_\_\_

**STEP 4**

Draw a picture of your sheets of paper to show how many parts each rectangle could have.

So, each rectangle could be cut into \_\_\_\_\_ parts.



**MATHEMATICAL PRACTICES 4**

**Use Models** How did the models help you find the common denominator for  $\frac{1}{2}$  and  $\frac{1}{3}$ ?

**Example** Write  $\frac{4}{5}$  and  $\frac{1}{2}$  as a pair of fractions with common denominators.

You can use common multiples to find a common denominator. List multiples of each denominator. A common multiple can be used as a common denominator.

**STEP 1** List multiples of 5 and 2. Circle common multiples.

5: 5, 10, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**STEP 2** Write equivalent fractions.

$$\frac{4}{5} = \frac{4 \times \square}{5 \times \square} = \frac{\square}{10}$$

$$\frac{1}{2} = \frac{1 \times \square}{2 \times \square} = \frac{\square}{10}$$

Choose a denominator that is a common multiple of 5 and 2.

You can write  $\frac{4}{5}$  and  $\frac{1}{2}$  as \_\_\_\_\_ and \_\_\_\_\_.

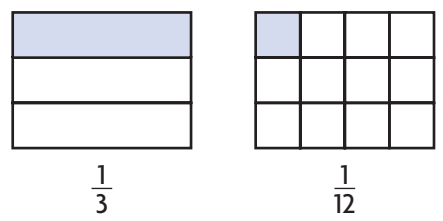
**ERROR Alert**

Remember that when you multiply the denominator by a factor, you must multiply the numerator by the same factor to write an equivalent fraction.

- Are  $\frac{4}{5}$  and  $\frac{1}{2}$  equivalent? Explain.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- Describe another way you could tell whether  $\frac{4}{5}$  and  $\frac{1}{2}$  are equivalent.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Share and Show** 

- Find a common denominator for  $\frac{1}{3}$  and  $\frac{1}{12}$  by dividing each whole into the same number of equal parts. Use the models to help.  
 common denominator: \_\_\_\_\_



Name \_\_\_\_\_

Write the pair of fractions as a pair of fractions with a common denominator.

2.  $\frac{1}{2}$  and  $\frac{1}{4}$

\_\_\_\_\_

3.  $\frac{3}{4}$  and  $\frac{5}{8}$

\_\_\_\_\_

4.  $\frac{1}{3}$  and  $\frac{1}{4}$

\_\_\_\_\_

5.  $\frac{4}{12}$  and  $\frac{5}{8}$

\_\_\_\_\_

### On Your Own

Write the pair of fractions as a pair of fractions with a common denominator.

6.  $\frac{1}{4}$  and  $\frac{5}{6}$

\_\_\_\_\_

7.  $\frac{3}{5}$  and  $\frac{4}{10}$

\_\_\_\_\_

**Math Talk**

#### MATHEMATICAL PRACTICES 6

**Explain** how using a model or listing multiples helps you find a common denominator.

Tell whether the fractions are equivalent. Write = or  $\neq$ .

8.  $\frac{3}{4} \bigcirc \frac{1}{2}$

9.  $\frac{3}{4} \bigcirc \frac{6}{8}$

10.  $\frac{1}{2} \bigcirc \frac{4}{8}$

11.  $\frac{6}{8} \bigcirc \frac{4}{8}$

12. **GO DEEPER** Jerry has two same-size circles divided into the same number of equal parts. One circle has  $\frac{3}{4}$  of the parts shaded, and the other has  $\frac{2}{3}$  of the parts shaded. His sister says the least number of pieces each circle could be divided into is 7. Is his sister correct? Explain.
- \_\_\_\_\_
- \_\_\_\_\_

# Problem Solving • Applications



13. **GO DEEPER** Carrie has a red streamer that is  $\frac{3}{4}$  yard long and a blue streamer that is  $\frac{5}{6}$  yard long. She says the streamers are the same length. Does this make sense? Explain.

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14. **THINK SMARTER** Leah has two same-size rectangles divided into the same number of equal parts. One rectangle has  $\frac{1}{3}$  of the parts shaded, and the other has  $\frac{2}{5}$  of the parts shaded. What is the least number of parts into which both rectangles could be divided?

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15. **MATHEMATICAL PRACTICE 6** Julian says a common denominator for  $\frac{3}{4}$  and  $\frac{2}{5}$  is 9. What is Julian's error? **Explain.**

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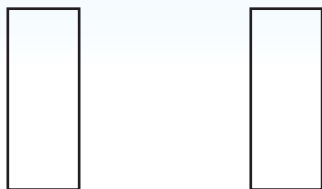


**WRITE** Math  
Show Your Work



16. **THINK SMARTER +** Miguel has two same-size rectangles divided into the same number of equal parts. One rectangle has  $\frac{3}{4}$  of the parts shaded, and the other has  $\frac{5}{8}$  of the parts shaded.

Into how many parts could each rectangle be divided? Show your work by sketching the rectangles.



**Personal Math Trainer**



Name \_\_\_\_\_

### Common Denominators



**COMMON CORE STANDARD—4.NF.A.1**  
Extend understanding of fraction equivalence and ordering.

Write the pair of fractions as a pair of fractions with a common denominator.

1.  $\frac{2}{3}$  and  $\frac{3}{4}$

2.  $\frac{1}{4}$  and  $\frac{2}{3}$

3.  $\frac{3}{10}$  and  $\frac{1}{2}$

Think: Find a common multiple.

3: 3, 6, 9, 12, 15

4: 4, 8, 12, 16, 20

$\frac{8}{12}, \frac{9}{12}$

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4.  $\frac{3}{5}$  and  $\frac{3}{4}$

5.  $\frac{2}{4}$  and  $\frac{7}{8}$

6.  $\frac{2}{3}$  and  $\frac{5}{12}$

7.  $\frac{1}{4}$  and  $\frac{1}{6}$

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Tell whether the fractions are equivalent. Write = or  $\neq$ .

8.  $\frac{1}{2} \bigcirc \frac{2}{5}$

9.  $\frac{1}{2} \bigcirc \frac{3}{6}$

10.  $\frac{3}{4} \bigcirc \frac{5}{6}$

11.  $\frac{6}{10} \bigcirc \frac{3}{5}$

### Problem Solving



12. Adam drew two same size rectangles and divided them into the same number of equal parts. He shaded  $\frac{1}{3}$  of one rectangle and  $\frac{1}{4}$  of the other rectangle. What is the least number of parts into which both rectangles could be divided?

13. Mera painted equal sections of her bedroom wall to make a pattern. She painted  $\frac{2}{5}$  of the wall white and  $\frac{1}{2}$  of the wall lavender. Write an equivalent fraction for each fraction using a common denominator.

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14. **WRITE** *Math* How are a common denominator and a common multiple alike and different?

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## Lesson Check (4.NF.A.1)

1. Write a common denominator for  $\frac{1}{4}$  and  $\frac{5}{6}$ .
2. Two fractions have a common denominator of 8. What could the two fractions be?

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## Spiral Review (4.NBT.A.2, 4.NBT.B.5, 4.NBT.B.6, 4.NF.A.1)

3. What number is 100,000 more than seven hundred two thousand, eighty-three?
4. Aiden baked 8 dozen muffins. How many total muffins did he bake?
5. On a bulletin board, the principal, Ms. Gomez, put 115 photos of the fourth-grade students in her school. She put the photos in 5 equal rows. How many photos did she put in each row?
6. Judy uses 12 tiles to make a mosaic. Eight of the tiles are blue. What fraction, in simplest form, represents the tiles that are blue?

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