Name _____

Common Denominators

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

Common Core **Number and Operations—Fractions—4.NF.A.1**

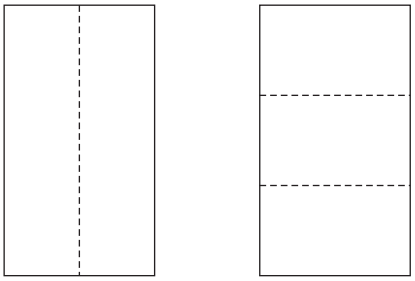
MATHEMATICAL PRACTICES
MP2, MP4, MP6

Unlock the Problem

Real World

Hands On

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.

Math Talk

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.

1. Are $\frac{4}{5}$ and $\frac{1}{2}$ equivalent? Explain.

_____

_____

_____

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

_____

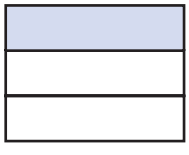
_____

_____

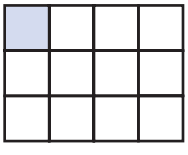
Share and Show MATH BOARD

1. 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: _____



$\frac{1}{3}$



$\frac{1}{12}$

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 $\frac{5}{8}$

Math Talk

MATHEMATICAL PRACTICES 6

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

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 $\frac{4}{10}$

Tell whether the fractions are equivalent. Write = or ≠.

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 Real World

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.

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?

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**.

WRITE Math
Show Your Work

Personal Math Trainer

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.

Name _____

Common Denominators

Common Core **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 $\frac{3}{4}$

Think: Find a common multiple.
3: 3, 6, 9, 12, 15
4: 4, 8, 12, 16, 20

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

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

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

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 $\frac{1}{6}$ _____

Tell whether the fractions are equivalent. Write = or ≠.

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 Real World

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.

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

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?

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?

FOR MORE PRACTICE GO TO THE Personal Math Trainer