LESSON 4

Number and Operations–Fractions

Model Equivalent Fractions

When students look at equivalent fractions in written form, such as $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, it is hard for them to understand that they are looking at the same fraction. When students divide an object several ways, they can see that the overall size of the object does not change—it just has a different number of equal-sized units.

Objective

Identify equivalent fractions using models.

Common Core State Standards

- **3.NF.3a** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
- **3.NF.3b** Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *What fraction was left when you took away 3 pieces from the Deluxe Rainbow Fraction® Circle made of 6 equal parts?*
- Explain to students that the fractions they made that cover the same part of the circle are called *equivalent fractions.* **Ask:** *What were some equivalent fractions for* $\frac{3}{6}$*?* Make sure students are able to list $\frac{1}{2}$, $\frac{2}{4}$, and $\frac{4}{8}$. **Say:** Equivalent *means same or equal.* **Ask:** *How do you know that the fractions you found are equivalent?*
- **Ask:** *What fraction did you have when you removed 1 piece of the circle made of 3 equal parts? What equivalent fractions did you find for* $\frac{2}{3}$*?*
- **Ask:** *Can you think of a situation in which you might want to know fractions that are equivalent to one another?*

Solve It

With students, reread the problem. Have students trace the circle pieces to show the different equivalents for $\frac{3}{6}$. Ask them to label each drawing with the fraction shown, drawing an equal sign between each equivalent fraction.

More Ideas

For other ways to teach about equivalent fractions—

- Have students use Fraction Tower® Cubes to make equivalent fractions. Give students a problem such as: *Sue had a granola bar. She divided it into 5 equal parts and ate 2 of them. Use cubes to show the fraction of granola bar that was left. Then find 1 equivalent fraction.*
- Have students work in groups using Geoboards to find other ways to make equivalent fractions. Ask students to show a fraction on the Geoboard, and then ask them to find an equivalent fraction.

Formative Assessment

Have students try the following problem.

Mrs. Daniel cut a pizza into 8 slices. The students ate 4 slices. The fractional part of the remaining pizza is $\frac{4}{8}$*. Which fraction below means the same as* $\frac{4}{8}$*?*

A. $\frac{2}{8}$ **B.** $\frac{1}{2}$ **C.** $\frac{4}{4}$ **D.** $\frac{8}{4}$

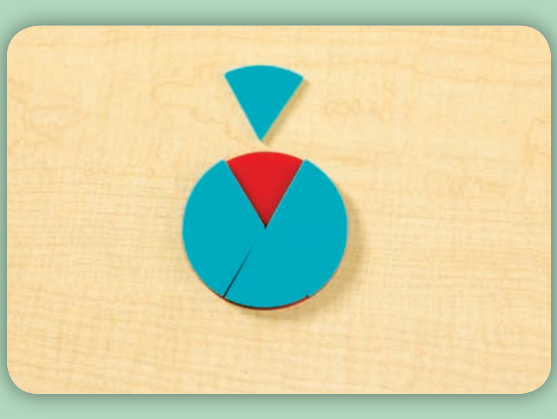
Try It! 25 minutes | Groups of 4

Here is a problem about equivalent fractions.

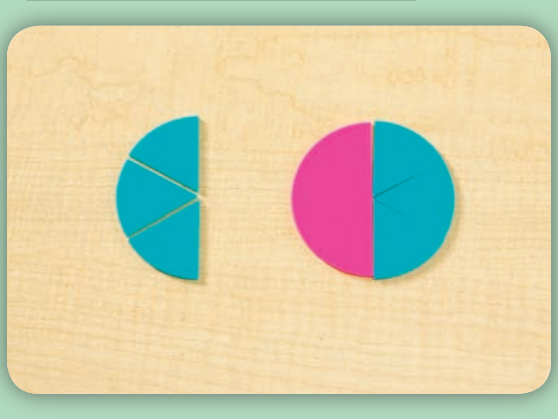
It is Darnell's birthday, so his mother brought a birthday cake to his after-school class for him to share with his friends. The cake was cut into 6 equal slices. If Darnell and his friends ate 3 of the 6 slices, what fraction of the cake was left over?

Introduce the problem. Then have students do the activity to solve the problem. Distribute Deluxe Rainbow Fraction Circles to students.

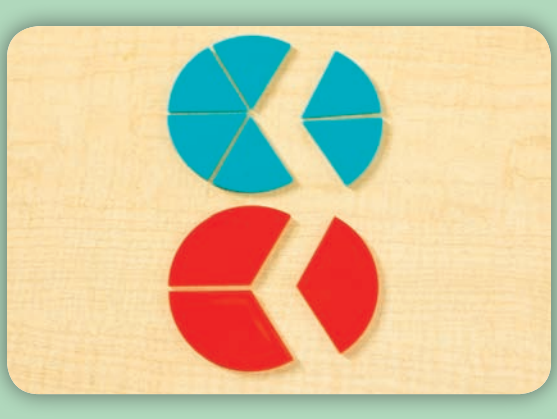
Materials
- Deluxe Rainbow Fraction® Circles (1 set per group)



1. Have students assemble all of the circles in the set and explore how each circle is divided into different numbers and sizes of pieces. **Say:** *Find the fraction pieces that make a circle out of 6 equal parts.* Make sure students use sixths to make a circle. Explain that the 6 pieces match the 6 equal pieces of the cake in the problem, and that combined, the 6 equal pieces make up 1 whole.



2. Say: *Let's take away the 3 pieces eaten by the kids.* **Ask:** *What is the fraction of the circle that is left? Can we use any other fractional parts to cover the $\frac{3}{6}$ that is left to make another fraction that means the same thing?* Students should find the equivalent fractions $\frac{1}{2}$, $\frac{2}{4}$, and $\frac{4}{8}$.



3. Have students create other equivalent fractions using circles. **Say:** *A pie is divided into 3 slices. One slice is removed.* **Ask:** *What fraction of the pie is left?* Then have students build models to show $\frac{2}{3}$ and then $\frac{4}{6}$.

⚠ Look Out!

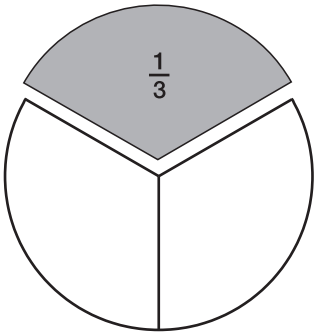
Stress that when finding equivalent fractions, students need to use the same size of the fractional parts. Watch for students who try to put together $\frac{1}{3}$ and $\frac{1}{6}$ to show $\frac{1}{2}$. Although these two fractions added together equal $\frac{1}{2}$, they are not creating an equivalent fraction for $\frac{1}{2}$. Stress the one-to-one correspondence of equivalent fractions: $\frac{1}{2} = \frac{3}{6}$. Although $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$ is true, it is an addition sentence, not a set of equivalent fractions.

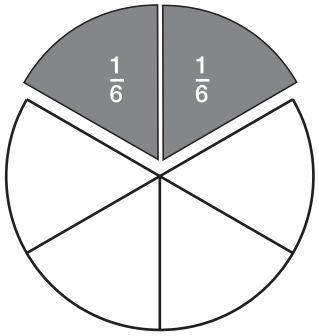
Answer Key

Use Fraction Circles to model each fraction. Write equivalent fractions for the shaded parts. Write equivalent fractions for the unshaded parts.

(Check students' work.)

1.

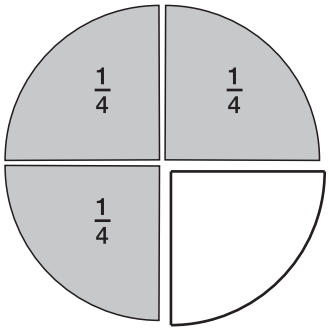


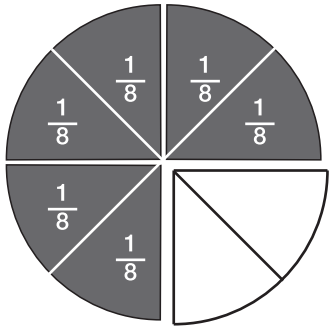


$\frac{1}{3} = \frac{2}{6}$

$\frac{2}{3} = \frac{4}{6}$

2.





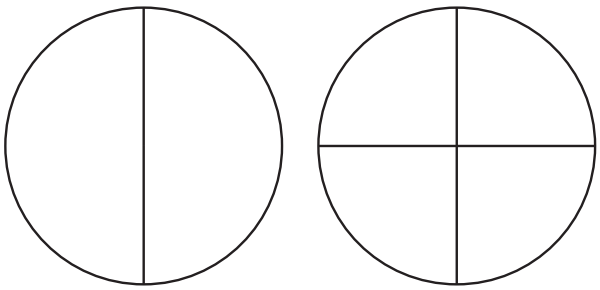
$\frac{3}{4} = \frac{6}{8}$

$\frac{1}{4} = \frac{2}{8}$

Using Fraction Circles, model the fraction. Then sketch a model or an equivalent fraction. Write the equivalent fraction.

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

(Check students' models.)



Write an equivalent fraction for each fraction.

4. $\frac{2}{3} = \frac{4}{6}$

5. $\frac{3}{4} = \frac{6}{8}$

6. $\frac{2}{8} = \frac{1}{4}$

7. $\frac{2}{4} = \frac{1}{2}$

8. $\frac{2}{6} = \frac{4}{12}$

9. $\frac{6}{8} = \frac{9}{12}$

© ETA hand2mind™

Answer Key

Challenge! Name another fraction equivalent to the fractions in Problem 9. Explain how you know that it is equivalent.

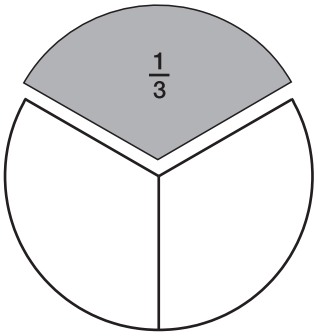
Challenge: (Sample) $\frac{3}{4}$ is equivalent to both the fractions in Problem 9. Three fourths parts are the same size as six eighths parts and nine twelfths parts.

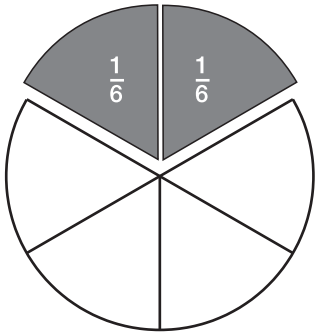
© ETA hand2mind™

Name _____

Use Fraction Circles to model each fraction. Write equivalent fractions for the shaded parts. Write equivalent fractions for the unshaded parts.

1.

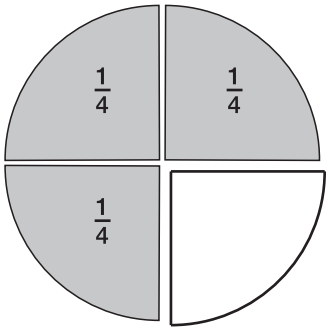


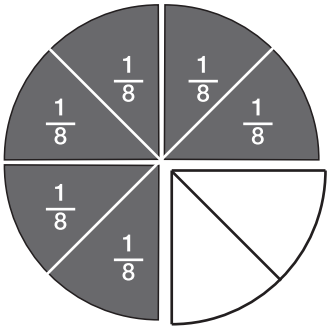


_____ = _____

_____ = _____

2.



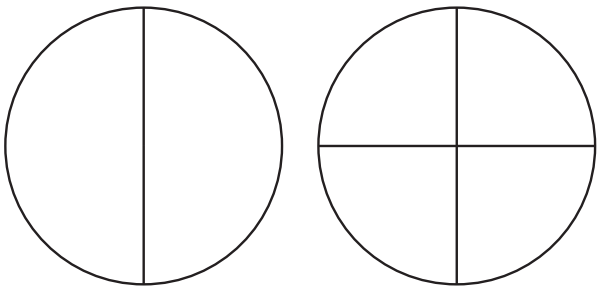


_____ = _____

_____ = _____

Using Fraction Circles, model the fraction. Then sketch a model or an equivalent fraction. Write the equivalent fraction.

3. $\frac{1}{2} = \frac{\quad}{4}$



Write an equivalent fraction for each fraction.

4. $\frac{2}{3} = \frac{\quad}{6}$

5. $\frac{3}{4} = \frac{\quad}{8}$

6. $\frac{2}{8} = \frac{\quad}{4}$

7. $\frac{2}{4} = \frac{\quad}{2}$

8. $\frac{2}{6} = \frac{\quad}{12}$

9. $\frac{6}{8} = \frac{\quad}{12}$

© ETA hand2mind™

Name _____

Challenge! Name another fraction equivalent to the fractions in Problem 9. Explain how you know that it is equivalent.

© ETA hand2mind™