

LESSON 5

Objective

Identify equivalent fractions using a number line model.

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.

Number and Operations—Fractions

Equivalent Fractions on a Number Line

As students develop a deeper understanding of fractions, they will see that there are different fractions that are the same point on a number line. Equivalent fractions need to be explored visually at first, so students can see the relationship. Exploring equivalent fractions on a number line prepares students to use operations to find equivalencies.

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

Talk About It

Discuss the Try It! activity.

- Draw a number line from 0 to 1 on the board. **Ask:** How many parts should we divide the space between 0 and 1 into to show Adam's sandwich? Have a student show halves on the number line. **Ask:** How many parts should we divide the space between 0 and 1 into to show Maya's sandwich? Have a student show fourths on the number line.
- **Say:** Look at the space between 0 and $\frac{1}{2}$. **Ask:** How many fourths are in that space? Write $\frac{1}{2} = \frac{2}{4}$ under the number line.
- **Ask:** How can we see on the Fraction Number Line, and with your Fraction Towers, that $\frac{1}{2}$ and $\frac{2}{4}$ are equal? Guide discussion to the fact that both fractions take up all the space between 0 and $\frac{1}{2}$.

Solve It

With students, reread the problem. Have students draw a number line and show that $\frac{2}{4}$ is the same point as $\frac{1}{2}$.

More Ideas

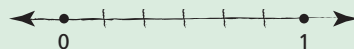
For other ways to teach about equivalent fractions—

- Have students use Fraction Tower® Cubes and Fraction Tower Number Lines (BLM 9) to find various equivalent fractions. Have students mark the equivalent fractions on a number line.
- Have students cut individual number lines from Fraction Tower Number Lines (BLM 9) and use them to find equivalent fractions. First have students fold one in half and mark the $\frac{1}{2}$ point. Then students can fold in half again and again, and unfold to see how many smaller parts are equal to one half. Have students write the fractions they discover.

Formative Assessment

Have students try the following problem.

Which statement is true?



- A. $\frac{1}{3} = \frac{1}{6}$ B. $\frac{1}{3} = \frac{2}{6}$ C. $\frac{1}{3} = \frac{3}{6}$ D. $\frac{1}{3} = \frac{4}{6}$

Try It! 20 minutes | Groups of 4

Here is a problem about equivalent fractions.

Adam and Maya are having lunch. Adam's sandwich is cut into 2 pieces, and Maya's sandwich is cut into 4 pieces. They want to trade half of their sandwiches. How many pieces does Adam give Maya? How many pieces does Maya give Adam?

Introduce the problem. Then have students do the activity to solve the problem. Distribute Fraction Tower Cubes and Fraction Number Lines to students.

Materials

- Fraction Tower® Cubes (1 set per group)
- Fraction Number Line (2 per group)



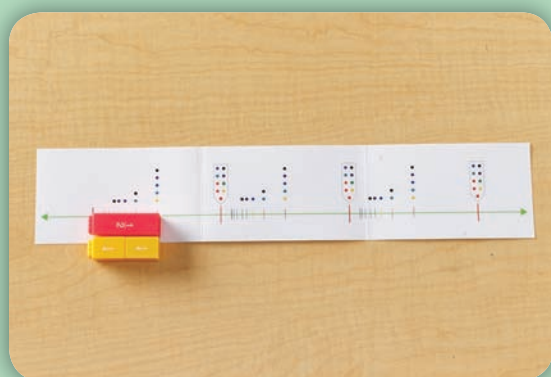
1. Have one pair of students model Adam's sandwich and another pair model Maya's using Fraction Towers. **Ask:** Which tower shows halves? Which tower shows fourths? Make sure students use the correct cubes.



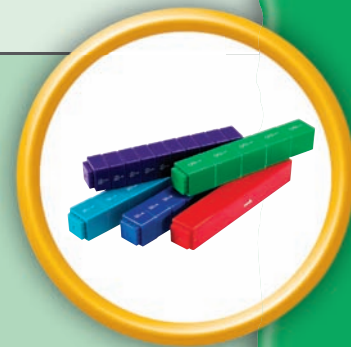
2. **Say:** Separate your towers into halves. Once you have two halves, trade one with your partners. Now compare the size of the tower you have left with the one you received. **Ask:** Are the towers the same size? Discuss that one of the $\frac{1}{2}$ pieces is the same as two of the $\frac{1}{4}$ pieces.

⚠ Look Out!

If students find the colored dots and lines on the Fraction Number Line confusing, use Fraction Tower Number Lines (BLM 9). Have them mark $\frac{1}{2}$ on a number line using a pink tower cube and then mark $\frac{2}{4}$ on the same number line using two yellow cubes.

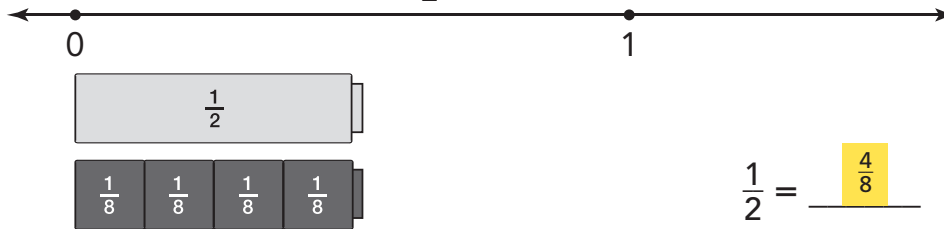


3. Have students lay their towers below a Fraction Number Line with the colored dots, making sure to align the left ends of the towers with zero on the number line. **Ask:** Are $\frac{1}{2}$ and $\frac{2}{4}$ equal? What do you think the colored dots above the one-half tick indicate? What other cubes could you use to build $\frac{1}{2}$?

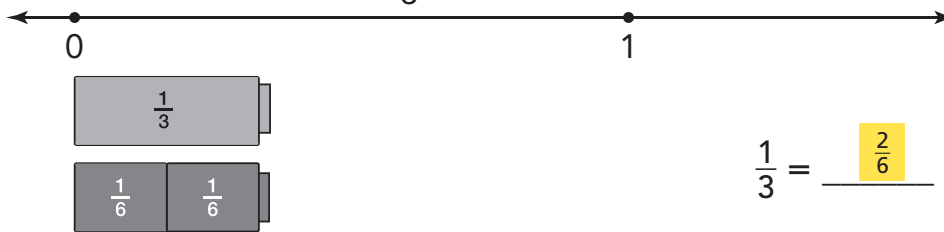


Use Fraction Tower Cubes and the Fraction Number Line to build the model. Write the equivalent fraction. (Check students' work.)

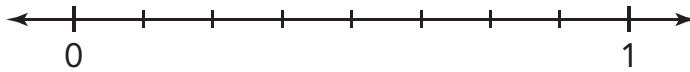
1. How many eighths are in $\frac{1}{2}$?



2. How many sixths are in $\frac{1}{3}$?



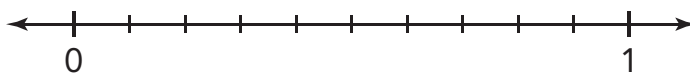
Look at each number line. Color and mark an equivalent fraction. Write the fractions. (Check students' work.)



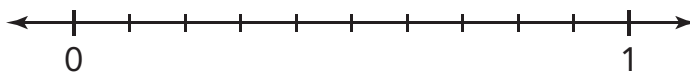
$\frac{6}{8}$ colored
 $\frac{3}{4} = \frac{6}{8}$



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



$\frac{6}{10}$ colored
 $\frac{3}{5} = \frac{6}{10}$



$\frac{5}{10}$ colored
 $\frac{1}{2} = \frac{5}{10}$

Answer Key

Challenge! Use Fraction Tower Cubes to draw and label two number lines. Then color and write two fractions equal to $\frac{1}{2}$.

$$\frac{1}{2} = \underline{\quad\quad} = \underline{\quad\quad}$$

Challenge: Number lines could show $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, or $\frac{6}{12}$.

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