**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?*
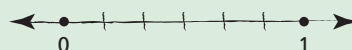


**A.** $\frac{1}{3} = \frac{1}{6}$     **B.** $\frac{1}{3} = \frac{2}{6}$     **C.** $\frac{1}{3} = \frac{3}{6}$     **D.** $\frac{1}{3} = \frac{4}{6}$

## 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)
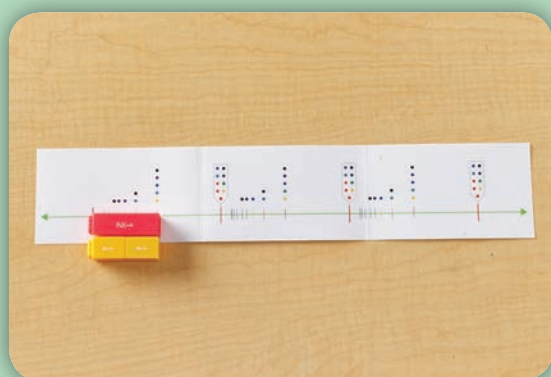- Fraction Number Line (2 per group)



**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.
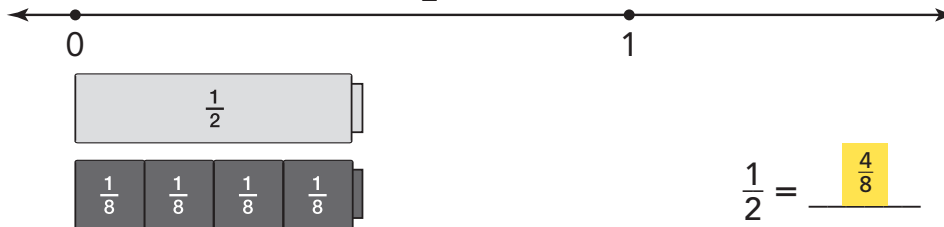


**3.** Have students lay their towers below a Fraction Number Line with the colored dots, making sure to align the left ends of the towers with zero on the number line. **Ask:** *Are $\frac{1}{2}$ and $\frac{2}{4}$ equal? What do you think the colored dots above the one-half tick indicate? What other cubes could you use to build $\frac{1}{2}$?*
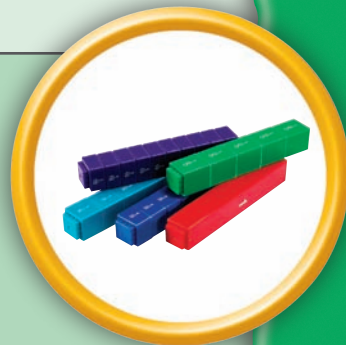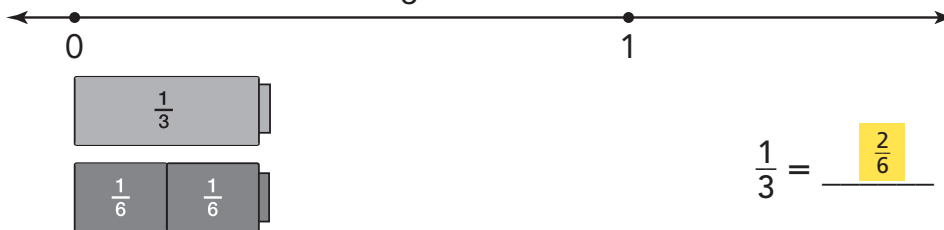
**Use Fraction Tower Cubes and the Fraction Number Line to build the model. Write the equivalent fraction.** (Check students' work.)
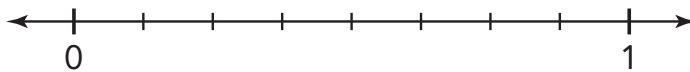
**1.** How many eighths are in $\frac{1}{2}$?

| $\frac{1}{2}$ |
|---|

| $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ |
|---|---|---|---|

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

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

| $\frac{1}{3}$ |
|---|

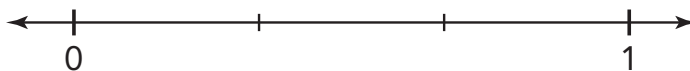| $\frac{1}{6}$ | $\frac{1}{6}$ |
|---|---|

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

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

**3.**

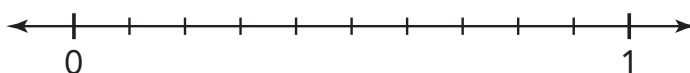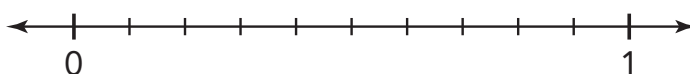$\frac{6}{8}$ colored

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

**4.**

$\frac{2}{3}$ colored

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

**5.**

$\frac{6}{10}$ colored

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

**6.**

$\frac{5}{10}$ colored

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

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

$\frac{1}{2} =$ _____ $=$ _____

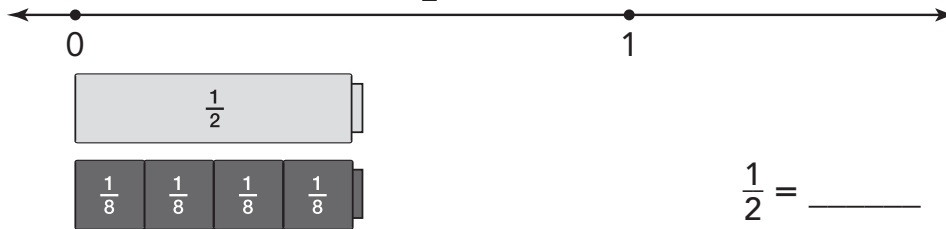Challenge: Number lines could show $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, or $\frac{6}{12}$.
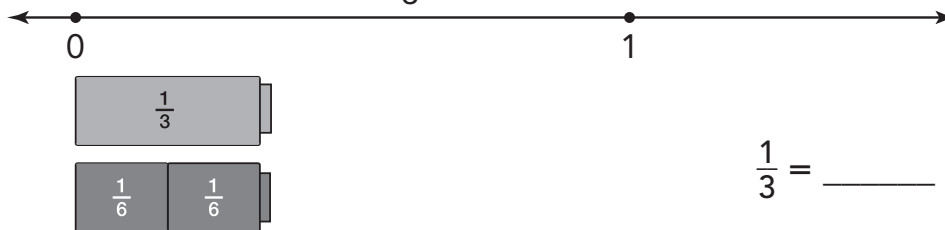
Name _____

**Use Fraction Tower Cubes and the Fraction Number Line to build the model. Write the equivalent fraction.**

**1.** How many eighths are in $\frac{1}{2}$?
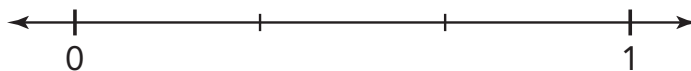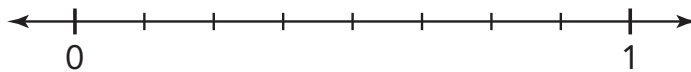
0             1

| $\frac{1}{2}$ |

| $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ |

$\frac{1}{2} =$ _____

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

0             1

| $\frac{1}{3}$ |

| $\frac{1}{6}$ | $\frac{1}{6}$ |

$\frac{1}{3} =$ _____

**Look at each number line. Color and mark an equivalent fraction. Write the fractions.**

**3.**

0        1

0        1

_____ = _____

**4.**

0        1

0        1

_____ = _____

**5.**

0        1

0        1

_____ = _____

**6.**

0        1

0        1

_____ = _____

Name _____

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

$\frac{1}{2}$ = _____ = _____

_____

_____

_____

_____

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