Objective

Represent a unit fraction on a number line.

Common Core State Standards

■ **3.NF.2a** Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.

Number and Operations–Fractions

Fractions on a Number Line

In this lesson, students build upon their previous understanding of a fraction as a part of a whole. They learn that the size of a fractional part $\frac{1}{b}$ is viewed relative to the size of the whole by partitioning the interval from 0 to 1 on a number line into *b* equal parts. Students use Fraction Tower® Cubes with number lines to visualize how unit fractions relate to the size of the whole.

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

Talk About It

Discuss the Try It! activity.

■ **Ask:** *How many fourths are equal to one whole?* Have students use Fraction Towers and the BLM to show that four fourths equal a whole. **Ask:** *What do we call one of the 4 pieces that make a whole?* Write $\frac{1}{4}$ on the board.

■ **Say:** *Let's say Melinda and her mom were making 6 bows from one piece of ribbon.* **Ask:** *How many pieces would they divide the ribbon into? What would you call one of the pieces then?* Write $\frac{1}{6}$ and have students use the turquoise Fraction Tower to divide the second number line on the BLM into sixths. Have them identify the first sixth and label the first tick $\frac{1}{6}$.

■ **Ask:** *What happens to the size of the parts when we break the whole into more pieces?*

Solve It

With students, reread the problem. Have them use the yellow Fraction Tower to draw a number line from 0 to 1 divided into fourths and label the first tick $\frac{1}{4}$. Have them write a sentence to answer the problem.

More Ideas

For other ways to teach about unit fractions on a number line—

■ Have pairs use Fraction Tower Cubes with Fraction Tower Number Lines (BLM 9) to explore other unit fractions. Have students divide and label each number line into thirds, sixths, and eighths. Have them identify one piece of the whole, and what it is called.

■ Have students cut Fraction Tower Number Lines (BLM 9) into pieces that show 0 to 1. Have them fold one number line into halves, one into fourths, and one into eighths. Have them identify one piece of the whole, and what it is called.

Formative Assessment

Have students try the following problem.

Which shows $\frac{1}{6}$?

A. 0 1

B. 0 1

C. 0 1

D. 0 1
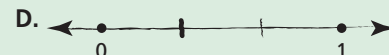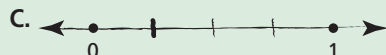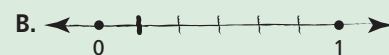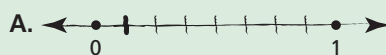
Try It!   30 minutes | Groups of 4

Here is a problem about unit fractions on a number line.

Melinda and her mom want to make 4 bows. They have one piece of ribbon that they want to divide equally to make the 4 bows. How much of the ribbon will each bow get?

Introduce the problem. Then have students do the activity to solve the problem. Distribute Fraction Tower Cubes, Fraction Tower Number Lines (BLM 9), and pencils to students.

Materials
- Fraction Tower® Cubes (1 set per group)
- Fraction Tower Number Lines (BLM 9; 1 per group)
- pencils (1 per group)

1. Ask: *How many pieces do Melinda and her mom need to divide the ribbon into? Which tower is divided into 4 pieces?* Have students find the yellow Fraction Tower and count the 4 pieces. Then have them compare the whole yellow tower to the whole red tower to show they are equal.

2. Say: *Lay the yellow tower on the first number line on your paper so that the ends fit between 0 and 1.* Explain that the 4 pieces of the tower make up the whole. Have students draw tick marks to partition the number line into fourths, using the yellow tower as a guide.

⚠ Look Out!

Help students recognize that each part has the size of $\frac{1}{4}$ piece, and that the endpoint of the first part based at 0 locates the first fourth, or $\frac{1}{4}$, on the number line.

3. Have students break the yellow tower into 4 pieces and explain how 1 piece is $\frac{1}{4}$ of the whole. Have them use a piece to show that each interval they drew on the number line is $\frac{1}{4}$. Then have them identify the first fourth and label the first tick mark $\frac{1}{4}$.
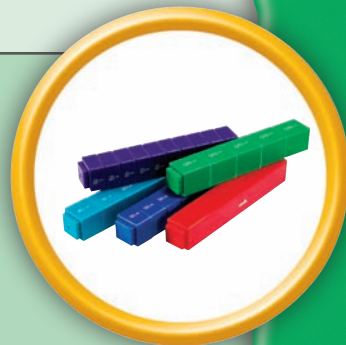
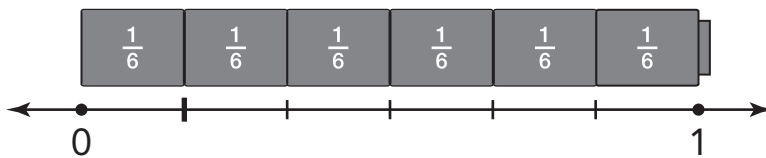**Use Fraction Tower Cubes and a number line to build each model. Circle the first part of the whole. Write the fraction.** (Check students' work.)

1. Jason breaks a stick into 3 equal pieces.

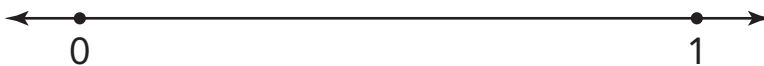| $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ |

0   1
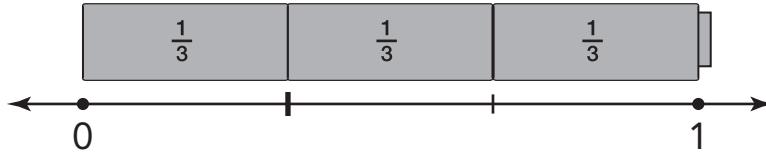
first third should be circled, $\frac{1}{3}$

2. Bailie divides a bar of clay into 6 equal pieces.

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

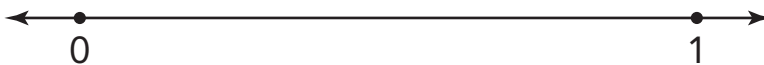0   1

first sixth should be circled, $\frac{1}{6}$

Use Fraction Tower Cubes and a number line to model each fraction. Draw the model. Color the first part of the whole. Mark the fraction on the number line. Write the fraction.

3. A string is cut into 4 equal pieces.

0   1

drawing should show fourths, first fourth shaded, first tick marked, $\frac{1}{4}$
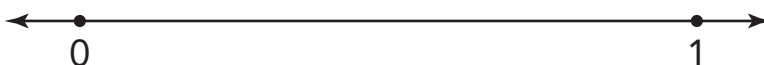
4. A banana is divided into 2 equal pieces.

0   1

drawing should show halves, first half shaded, half tick marked, $\frac{1}{2}$

Mark and label the fraction on the number line.

5. $\frac{1}{8}$ $\frac{1}{8}$ should be marked and labeled.

0   1

Download student pages at hand2mind.com/hosstudent.
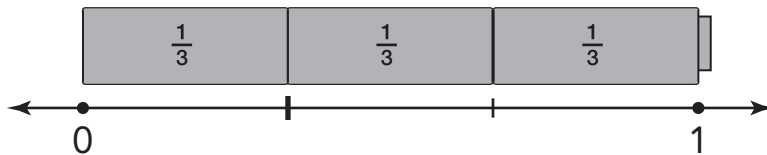
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Challenge!   Using Fraction Tower Cubes, draw a number line and show a whole divided into 10 equal parts. Color one piece of the whole. Write the fraction.

Challenge: Number line should be divided into 10 reasonably equal pieces with 1 piece colored; $\frac{1}{10}$.
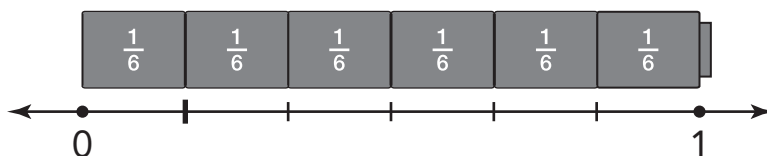
Name _____

Use Fraction Tower Cubes and a number line to build each model. Circle the first part of the whole. Write the fraction.

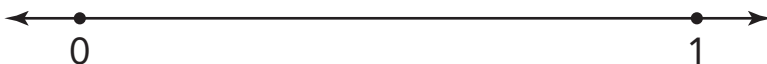**1.** Jason breaks a stick into 3 equal pieces.

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

0   1

_____

2. Bailie divides a bar of clay into 6 equal pieces.

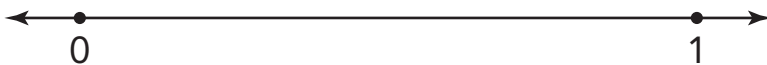| $\frac{1}{6}$ | $\frac{1}{6}$ | $\frac{1}{6}$ | $\frac{1}{6}$ | $\frac{1}{6}$ | $\frac{1}{6}$ |

0   1

_____

Use Fraction Tower Cubes and a number line to model each fraction. Draw the model. Color the first part of the whole. Mark the fraction on the number line. Write the fraction.

3. A string is cut into 4 equal pieces.
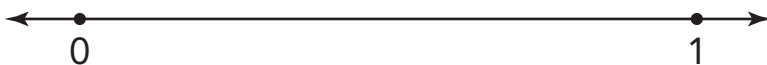
0   1

_____

4. A banana is divided into 2 equal pieces.

0   1

_____

Mark and label the fraction on the number line.

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

0   1

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Name _____

Challenge!   Using Fraction Tower Cubes, draw a number line
and show a whole divided into 10 equal parts. Color one piece of
the whole. Write the fraction.

_____

_____

_____

_____

_____

_____

_____

_____

Name

0   1

0   1

0   1

0   1

0   1

0   1