4

Common Core State Standard

3.NF.A.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.

Unit Fractions on a Number Line

Students have learned to identify and represent whole numbers on a number line. They extend this knowledge to reason that between any two whole numbers there are more numbers, and they identify these additional numbers by partitioning the whole-number intervals into smaller, equal-length intervals. These intervals define a unit-fraction length.

Vocabulary/ELL Support
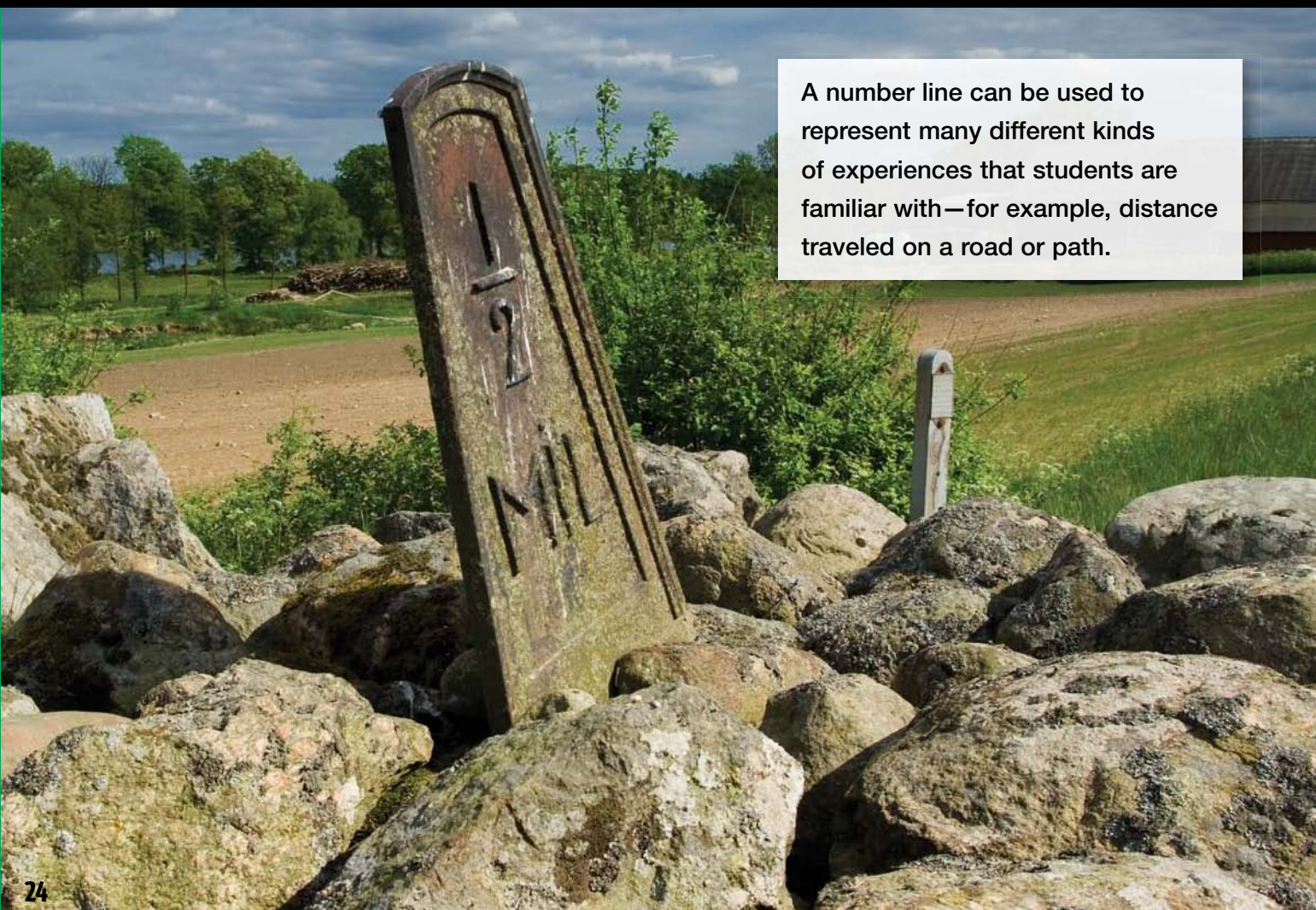
Draw a number line showing 0–5.

- **Ask:** *How could we divide up each whole unit into smaller parts?* [Sample: by making equal-sized pieces.]

Divide 0–1 into fourths.

- **Ask:** *What part of the whole unit is each small unit?* [$\frac{1}{4}$]

Explain that $\frac{1}{4}$ is called a **unit fraction** because it is the length of one part, or one small unit, when the whole is divided into fourths.

- A **unit fraction** is a fraction which has a numerator of 1.
- **Ask:** *Can you identify a unit fraction on our number line?*

A number line can be used to represent many different kinds of experiences that students are familiar with—for example, distance traveled on a road or path.

Set the Stage

Build Background   WHOLE CLASS

■ **Ask:** *How do you model whole numbers on a number line?* Listen for answers that suggest drawing a line, marking off equal-length intervals, and labeling the marks 0, 1, 2, 3, and so on.

Have students use Fraction Tower® Equivalency Cubes and Fraction Number Lines (Number 3, the blank line) to draw a number line showing the whole numbers 0–3. Students may use the red tower and a dry erase marker to mark and label 0–1, then 1–2, then 2–3. They also could assemble a whole tower of any color to represent the whole. Observe and interact with students as necessary.

Warm-Up Activity

Use this short thinking exercise to jump-start the instructional session.

Name ___Answer Key___

4

What fraction of the building is shaded?

a.   b.   c.

ANSWER a. $\frac{1}{3}$ is shaded; **b.** $\frac{1}{4}$ is shaded; **c.** $\frac{1}{4}$ is shaded

COMMENTS & EXTENSIONS According to a researcher of mathematical giftedness, Julian Stanley, a major aspect of mathematical thinking is the ability to see straight into the heart of an issue. Help students to see that in building **a** 1 of 3 levels of the building is shaded. Thus $\frac{1}{3}$ is shaded. There is no need to count the shaded blocks and the total number of blocks, though one can if one wants to.

Understand Fractions ■ Lesson 4   Hands-On Standards®, Common Core Fractions

Online resource available at **hand2mind.com/hosfractionsgr3**

Foundation Skill Practice

Use this VersaTiles® activity to help students activate their prior knowledge.

Parts in the Shade

Find the fraction that describes the part of the group or region that is shaded.

1   2

3   4

5   6

7   8

9   10

11   12

Answer box

A	B	C	D	E	F
$\frac{1}{10}$	$\frac{1}{7}$	$\frac{1}{11}$	$\frac{1}{4}$	$\frac{1}{9}$	$\frac{1}{15}$
G	**H**	**I**	**J**	**K**	**L**
$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{5}$	$\frac{1}{12}$	$\frac{1}{2}$

8   **Objective:** Name a unit fraction from a group of objects.

VersaTiles® student book, page 8

Materials

- Fraction Tower® Equivalency Cubes
- Fraction Number Lines (Number 3, the blank line)
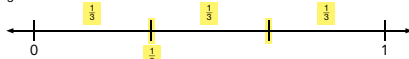- dry erase markers

Guided Practice

Lesson 4 Unit Fractions on a Number Line   Name __*Answer Key*__

Try This
- Model each unit fraction on the number line.
- Use Fraction Towers to divide the whole into equal parts.
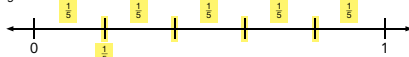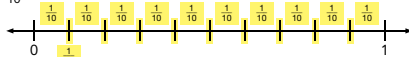- Locate and label the unit fraction.

1. $\frac{1}{3}$

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

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

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

5. $\frac{1}{10}$

Understand Fractions ■ Lesson 4   Hands-On Standards®, Common Core Fractions

© ETA hand2mind®

Online resource available at **hand2mind.com/hosfractionsgr3**

Model the Activity   WHOLE CLASS

Distribute Fraction Towers and Fraction Number Lines to students. Point out that while the towers are divided into different numbers of equal parts, the whole is the same length in each case. Have students follow along as you demonstrate the activity.

Use the red tower to model a whole on the blank Fraction Number Line. Use a dry erase marker to mark and label 0 and 1.

- **Ask:** *How can you use Fraction Towers to divide the whole into two equal-sized parts?* [Use the pink tower to mark the halfway point.]
- **Ask:** *What fraction of the whole is each part?* [$\frac{1}{2}$] Have students write $\frac{1}{2}$ above each part to indicate that each part is $\frac{1}{2}$ of the whole.
- **Say:** *Starting from 0, the endpoint of the first half is the number $\frac{1}{2}$. Label $\frac{1}{2}$.* Students label the midpoint $\frac{1}{2}$.

Now ask students to demonstrate how to model $\frac{1}{3}$. [Use an orange tower to mark thirds.] Above each third, write $\frac{1}{3}$. Have them label the $\frac{1}{3}$ tick mark.

Explain that in the two cases, $\frac{1}{2}$ and $\frac{1}{3}$ are unit fractions because they describe one part of the whole.

Guided Practice   SMALL GROUPS

Each small group will need Fraction Towers and a blank Fraction Number Line (Number 3).

Students use the towers and number line to model the given unit fractions. Students use dry erase markers to mark off the appropriate number of equal parts, label the parts, and label the endpoint of the first part. Students understand that the endpoint of the first part locates the value of the unit fraction.

Reinforce the Concept

Check for Understanding   WHOLE CLASS

Observe students as they mark off lengths and locate the fractions on the blank Fraction Number Line.

■ **Ask:** *How do you show the length from 0 to 1 on the number line?* [use the red tower or any other tower with all its pieces put together] *How do Fraction Towers help you model the equal parts for the fractions?* [The tower pieces show me where to make the tick marks.]

Summarize   WHOLE CLASS

■ **Ask:** *How do you locate a unit fraction on a number line?* [Mark off the correct number of equal parts between 0 and 1, then find the endpoint of the first part.] Have students describe the concept in writing or with a picture.
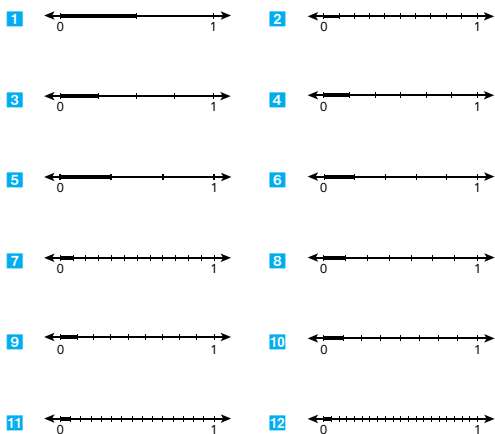
Independent Practice

Use this VersaTiles® activity to give students more practice with the skills they learned in the lesson.

What Unit Am I?

Identify the unit fraction on each number line.

1 0 —— 1   2 0 —— 1

3 0 —— 1   4 0 —— 1

5 0 —— 1   6 0 —— 1

7 0 —— 1   8 0 —— 1

9 0 —— 1   10 0 —— 1

11 0 —— 1   12 0 —— 1

Answer Box

A $\frac{1}{7}$	B $\frac{1}{5}$	C $\frac{1}{9}$	D $\frac{1}{4}$	E $\frac{1}{8}$	F $\frac{1}{6}$
G $\frac{1}{10}$	H $\frac{1}{20}$	I $\frac{1}{3}$	J $\frac{1}{15}$	K $\frac{1}{2}$	L $\frac{1}{12}$

Objective: Identify a unit fraction on a number line.   9
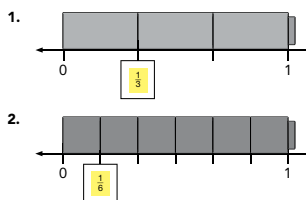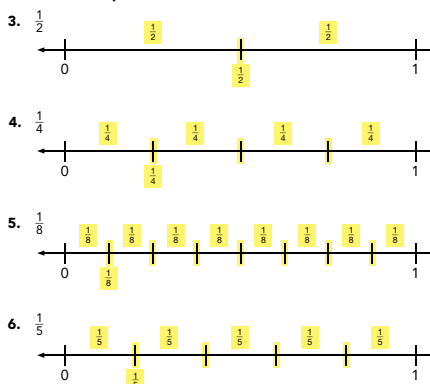
VersaTiles® student book, page 9

Remediation

Use this page to give students additional concrete-to-abstract practice.

Lesson 4 Unit Fractions on a Number Line   Name _Answer Key_

Use Fraction Tower Cubes and a blank Fraction Number Line to build the model. Write the unit fraction in the box.

1. 0 —— 1 $\frac{1}{3}$

2. 0 —— 1 $\frac{1}{6}$

Use Fraction Tower Cubes to divide the whole into equal parts, and label each part. Locate and label the unit fraction.

3. $\frac{1}{2}$ 0 —— 1 $\frac{1}{2}$

4. $\frac{1}{4}$ 0 —— 1 $\frac{1}{4}$

5. $\frac{1}{8}$ 0 —— 1 $\frac{1}{8}$

6. $\frac{1}{5}$ 0 —— 1 $\frac{1}{5}$

Understand Fractions ■ Lesson 4   Hands-On Standards®, Common Core Fractions

Online resource available at **hand2mind.com/hosfractionsgr3**

Enrichment

VersaMate™

This hands-on strategy game combines skill-building fractions practice with tactical game play.

Sample Activities

Fractions

Identify Fractions

hand2mind.com/versamate   App Store