

Teacher Edition

Revised Edition

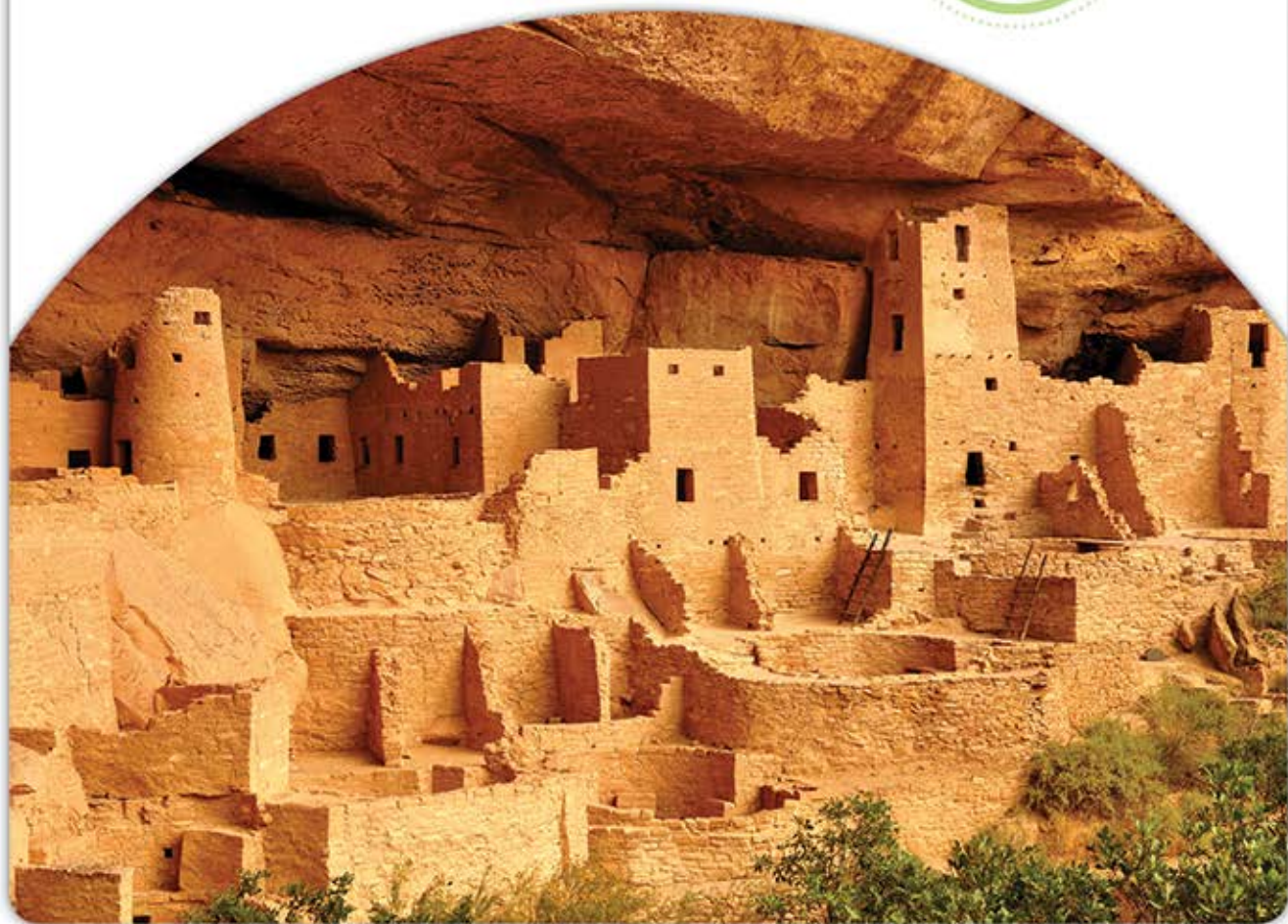
Performance

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Mathematics

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Fractions on a Number Line

Student Edition pages 167–176

LESSON OVERVIEW

Objectives

Students will:

- Plot unit fractions on a number line
- Plot fractions in the form $\frac{a}{b}$ on a number line that has each whole divided into b equal parts
- Plot fractions that equal whole numbers on a number line

Materials

- Math Tool: Number Lines, p. C11
- Math Tool: Fraction Strips, p. C18

Discussion Questions

MP6 How do you plot a fraction on a number line?

MP7 How does using a number line to model a fraction compare to using other tools to model fractions?

Differentiation

Lesson Support Have students use Math Tool: Fraction Strips to plot fractions on number lines. For a problem, have students use cut-out fraction strips for 1 in halves, thirds, fourths, sixths, and eighths. Have them place the strip above a number line for 1 whole that is divided into the same number of parts as the strip. Have them shade the fraction strip to model the fraction, then circle the part of the number line that is the same length as the shaded part of the strip. For fractions greater than 1, have students use two fraction strips and two number lines taped together end to end.

Lesson Extension Give students two number lines: one in sixths and the other in eighths. On the first number line, mark $\frac{2}{6}$; mark $\frac{5}{8}$ on the other. Place one number line directly above the other. Ask: *Which fraction is closer to 0? Which fraction is closer to 1? How did the number lines help you tell which whole number each fraction is closer to?*

1 GETTING THE IDEA

Draw a 1-whole fraction strip on the board and an unlabeled $\frac{3}{3}$ fraction strip below it. Ask: *What part of a whole is each part of the strip?* ($\frac{1}{3}$) *How do you know?* (The parts are equal, 1 out of 3 parts is shaded.) Shade the first $\frac{2}{3}$ of the strip. Ask: *What part of the strip is shaded?* ($\frac{2}{3}$) Write $\frac{2}{3}$ on the board. Shade the whole strip. Ask: *What part of the strip*

is shaded? Write $\frac{3}{3}$ on the board. Draw a number line from 0 to 1 below the $\frac{3}{3}$ fraction strip, label 0 and 1, and divide the whole into thirds. Ask: *What part of a whole is each part of the number line?* ($\frac{1}{3}$) *How do you know?* Student responses will give you an opportunity to review lesson vocabulary, assess understanding, and identify any misconceptions.

► **Example 1**

After Step 2, emphasize that only the mark at the end of the first part is named $\frac{1}{3}$. Have students place a finger on 0 on the number line and move to the right. When they have moved from 0 to $\frac{1}{3}$, they have moved $\frac{1}{3}$ of the length from 0 to 1.

► **Example 2**

Before Step 1, ask: *What part of a whole is each part of the number line?* ($\frac{1}{4}$) *Will you need to circle 1 part of the number line or more than 1 part to show $\frac{3}{4}$?* (more than 1) *Why?* (A model of $\frac{3}{4}$ must show three $\frac{1}{4}$ parts.)

▲ **ELL Support** Use these sentence frames to help students express their understanding of using a number line to model fractions.

Beginning: The ringed part of the number line is $\frac{3}{4}$. One whole is divided into _____ equal parts. _____ of the parts are ringed. (4, 3)

Intermediate: The ringed part of the number line is $\frac{3}{4}$ because one whole is divided into _____ of the parts are ringed. (4 equal parts, 3)

Advanced: The ringed part of the number line is $\frac{3}{4}$ because _____ is divided into _____, and _____ of the parts are _____. (one whole, 4 equal parts, 3, ringed)

► **Example 3**

Make sure students understand that when the problem says the *entire* straw it means the whole straw, which is the same as 1 whole, or 1.

▲ **Journal Prompt MP7** Suppose Meg had cut her straw into sixths or eighths and used the entire straw. Write fractions to represent the total amounts of the straw she used.

► **Example 4**

Before students look at the solution, ask: *Why do you think a number line from 0 to 2 is shown?* (There are two halves in 1 whole, so $\frac{3}{2}$ must be more than 1.)

2 COACHED EXAMPLE

This example requires students not only to find how many equal parts to divide each whole on the number line into, but also how many parts to ring. Before students start, *What does the numerator of a fraction describe?* (the number of parts being

considered) *What does the denominator of a fraction describe?* (the number of parts in all) *For this problem, how many equal parts will you divide 1 into on the number line?* (3)

For answers, see Appendix A.

3 LESSON PRACTICE

As students are working, pay special attention to problems 7, 8, and 11. Each problem describes a fraction using words (e.g., sixths). Suggest that students underline the words or numbers in each problem that tell the number of parts in 1 whole or the size of the parts as well as the number of

parts used. For problem 8, encourage students to show Reg's work on the number line to help them complete the sentences. For additional help, provide Math Tool: Fraction Strips and Math Tool: Number Lines for modeling the problems.

For answers, see Appendix A.