

Preparing a Lesson

1

The *Objective* sidebar clearly indicates the focus of each lesson.

2

Vocabulary words and definitions are listed in the *Vocabulary* sidebar in the order they appear in the lesson.

3

The *Preparation* sidebar identifies materials that need to be obtained and activities that should be performed in advance. Its handprint icon appears beside the components of the lesson that require preparation.

The *Alternative* sidebar and *Safety* sidebar (not shown) contain icons that appear beside headings as needed. These sidebars provide ways to expedite or simplify activities or add caution for the teacher when materials or activities could trigger student allergies or health conditions.

4

The *Extension* sidebar offers ideas to extend certain parts of the lesson, cross-curricular activities, and circular review.

5

The *Worldview* section connects mathematical concepts to biblical teaching that the teacher can share with students.

6

Introduction contains activities or discussions that will elicit students' interest in the topic.

7

Directed Instruction gives sequential instructions to teach the concepts of the lesson and a guide for how students should complete their pages. This section also provides optional activities to reinforce the objective.

10.1 Explore Fractions

Fractions

1 OBJECTIVE

- Students will define a fraction as an equal part of a whole and differentiate between numerators and denominators.

2 VOCABULARY

- **fraction** a number that names part of a whole or part of a set
- **denominator** the bottom number in a fraction that shows the total number of parts in a whole
- **numerator** the top number in a fraction that shows the number of equal parts being separated

3 PREPARATION

- Send **BLM 10.1A Chapter 10 Parent Letter** to parents electronically or by printing a copy for each student to take home.
- Select **Chapter 10 Warm Ups** for use throughout the chapter. (*Introduction*)
- Print enough copies of **BLM 10.1B Fraction Cookies** for each student to receive one section of a cookie. (*Introduction*)
- Select **TM 10.1A Fractions** for display. (*Directed Instruction*)
- Obtain the demonstration clock from the ACSI Math Manipulatives Kit. (*Directed Instruction*)

4 EXTENSION

- Have students find examples of fractions in the room, such as floor squares, clock faces, and desk arrangements. As an example, if a window is equally divided into 4 sections, point to 1 section and identify it as $\frac{1}{4}$. Direct students to write the fraction both in numerals and in words on their whiteboards.

Worldview 5

Encourage students to share what they have learned from the Bible about the Garden of Eden. (*Answers will vary.*) Read **Genesis 2:10–14**. Explain that a river flowed from the Garden and then separated into four smaller rivers. Share that the Garden of Eden's exact location is not known, but the location of the current-day Tigris and Euphrates Rivers is just north of the Persian Gulf. Mention that the focus of this chapter is on parts that make up a whole, just as those four separate rivers came from one whole river.

Introduction 6

Explain that Mr. Windsor's third-grade class had a cookie party. Mr. Windsor wanted everyone to have a cookie, but he discovered that all the cookies were broken, so he had to give his students pieces instead of whole cookies. Distribute the cookie pieces from **BLM 10.1B Fraction Cookies** and inform students that these pieces are like those that Mr. Windsor gave his class. Have students take their pieces and get together with others who have the same size pieces to make a whole cookie. When everyone is in a pair or trio, have students explain why there are different-sized groups of students. (**because the cookie pieces are different sizes**) Did each of Mr. Windsor's students receive a fair share of the cookies? Explain. (**No, some received smaller pieces than others.**) How many cookies would be needed if there were 18 students in Mr. Windsor's class and they each received a half? Explain. (**9, because $18 \div 2 = 9$**) Have students determine how many cookies would be needed for each person in your class to receive a fair share of half of a cookie.

Directed Instruction 7

1 Explain that numbers that are equal parts of a whole are **fractions**. Students can solve many everyday problems, such as the cookie example from *Introduction*, by understanding fractions. Define *fraction* and mention that a fraction names an amount less than one. Emphasize the importance of all fraction pieces being equal in size. Direct students to describe places where they have seen fractions. (**Possible answers: in recipes, at the grocery store, in sporting events with halftime or quarters**)

2 Distribute an index card to each student. Direct students to fold the card in half so the fold runs vertically down the middle of the card. Display the red card of **TM 10.1A Fractions**. Explain that together, both red halves make one whole. Write *halves* on the board and explain that when a number or group is divided into 2 equal parts, the parts are called halves. Direct students to fold their index cards in half again to create fourths. Display the yellow card of **TM 10.1A** to demonstrate that these 4 equal pieces make 1 whole. Write *fourths* on the board and explain that when dividing into 4 equal parts, the parts are called fourths. Direct students to fold their cards once again to make 8 equal parts. Display the blue card on **TM 10.1A** to demonstrate the whole and the equal parts. Explain that when a whole is divided into 8 equal parts, the parts are called eighths.

Direct students to cut apart the eighths they just folded and to hold up one of the pieces. Explain that this is one-eighth and write *one-eighth = $\frac{1}{8}$* on the board. Point to the 8 and define it as the **denominator**, the bottom number of the fraction. Mention that the denominator names the total number of equal parts in the whole. Ask students what the denominator would be if they had cut the card into halves. (2) Into fourths? (4)

Point to and define **numerator** as the top number of the fraction, which names the number of equal parts being separated. In this case, 1 part out of 8, or $\frac{1}{8}$, was separated. Call out other fractions, such as $\frac{2}{8}$, $\frac{3}{8}$, or $\frac{7}{8}$ for students to display. Call out $\frac{2}{2}$ and explain that when the numerator and denominator are the same, the fraction names one whole.

- 3** Draw a circle and divide it into fourths. Shade one of the sections and ask students whether it is one-fourth. (**Yes.**) Demonstrate how to count the number of pieces in all and write that number under the fraction line (or fraction bar) as students identify it as the denominator. Count the number of shaded parts and write that number above the fraction line as students identify it as the numerator. Practice with several different circles divided into different equal parts, such as thirds or sixths.
- 4** Set the demonstration clock to 4:30 and ask students how much time has passed since 4:00. (**30 min**) Explain that one half-hour has passed because the minute hand has gone halfway around the clock. Ask which fraction they could write to show half an hour. ($\frac{1}{2}$) Mention that it is half past four or 4:30. Show quarter hours in the same way and relate them to the fraction $\frac{1}{4}$.
- 5** Direct students' attention to the first student page. Explain that this chapter's theme is life in Australia. Read the top portion of the page together. Work the exercises together by having students identify whether the numerator or denominator is missing and then counting the sections of the fraction to determine the missing number.
- 6** Guide students to the next student page. Explain the directions and direct students to complete the page.

Lesson Review 8

Have students use their math journals to define and to give examples of the terms *fraction*, *denominator*, and *numerator*. Direct students to describe the numerator in their own words. (**Answers will vary but should include the number of parts being separated.**) How would you describe the denominator in your own words? (**Answers will vary but should include the total number of parts in the whole.**)

RECOVERY 10

• Distribute 10 connecting cubes (5 of one color to one partner and 5 of a different color to the other partner) to each pair of student. Direct students to connect 5 of the same color and to use a whiteboard to write the fraction $\frac{5}{10}$. Have students trade one connecting cube with their partners. Guide them to write a new fraction that shows how many of their color of cubes make up the fraction. ($\frac{1}{2}$) Continue this process until they reach $\frac{1}{2}$. Then, direct them to trade as many cubes as they want and to write the fraction.

ENRICHMENT 11

• Have students design posters, tongue twisters, songs, or computer presentations to demonstrate their knowledge of the words *fraction*, *denominator*, and *numerator*. Allow time for them to display or perform their creations.

8

Lesson Review offers specific questions or activities to assess students' understanding of lesson content.

9

Readable reductions of each student textbook page are large enough for the teacher to read the text and the answers to the exercises.

10

The activities in the *Recovery* sidebar can be used for differentiated learning instruction or to supply extra practice for students who would benefit from more opportunity to learn the concepts taught.

11

The *Enrichment* sidebar lists activities that will challenge those students who have clearly understood the concepts presented and are ready to learn more.

9

Name _____

Explore Fractions 10.1

Fractions can be used to name numbers less than one. Fractions name equal parts of a whole.

1 whole

halves

2 equal parts

thirds

3 equal parts

fourths

4 equal parts

sixths

6 equal parts

eighths

8 equal parts

The **denominator** is the number written below the line in a fraction. The denominator is the total number of equal parts in one whole.

The **numerator** is the number written above the line. The numerator is the number of equal parts being separated.

● ● ● ● ● ● ● ●

Fill in the missing numerator or denominator of the fraction for the colored parts.

$\frac{1}{4}$

$\frac{2}{3}$

$\frac{3}{8}$

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Match the fraction name to the colored part of the model.

4.

8.

5.

9.

6.

10.

7.

11.

Shade the model to show each fraction. **Drawings will vary.**

12.

$\frac{1}{3}$

13.

$\frac{5}{8}$

14.

$\frac{2}{6}$

15.

$\frac{3}{8}$

16.

$\frac{3}{4}$

Review

17. Multiply.

24	36	45	205	314	600
x 2	x 4	x 5	x 8	x 7	x 9
48	144	225	1,640	2,198	5,400

2,314	1,823	4,078	2,879	7,821	5,736
x 2	x 3	x 6	x 4	x 2	x 5
4,628	5,469	24,468	11,516	15,642	28,680

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