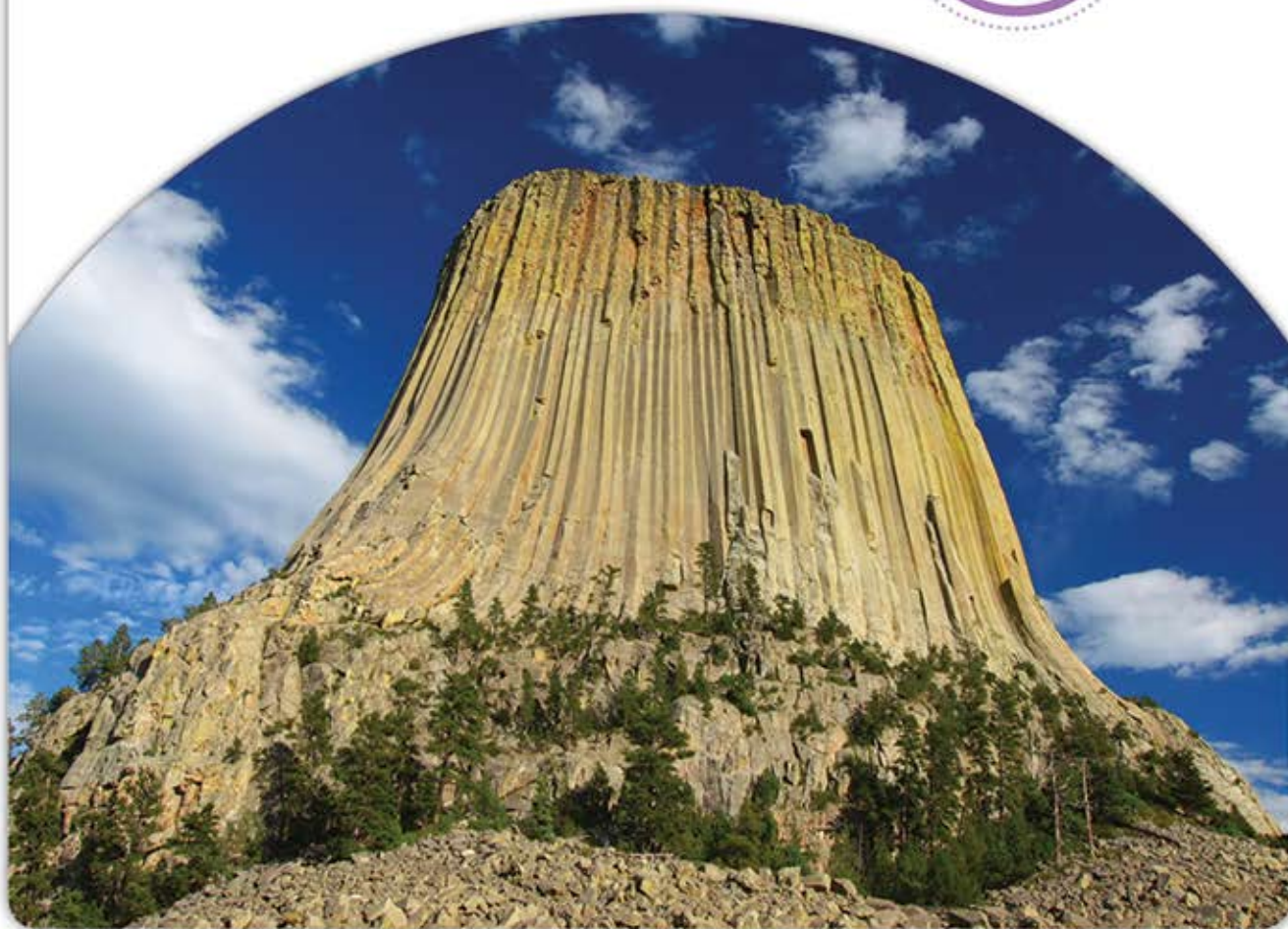


Teacher Edition

Revised Edition

Performance Coach[™] Mathematics

6



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Understanding Ratios

Student Edition pages 6–12

LESSON OVERVIEW

Objectives

Students will:

- Understand ratios and use ratio language to describe relationships between quantities
- Use ratio relationships to solve problems
- Recognize different types of ratios (part-to-part, part-to-whole, and whole-to-part) and different notations used to identify ratios

Discussion Questions

- MP2** How do you know when a ratio is part-to-part or part-to-whole? Why is it important to determine the type of ratio?
- MP7** How could you use a part-to-whole ratio to write a part-to-part ratio?
- MP8** An example of a ratio that will always be the same is the number of corners of a square to the number of sides of a square. Describe another ratio that will always be the same.

Key Term

ratio

Materials

- Two-colored counters or connecting cubes in different colors
- Colored pencils

Differentiation

Lesson Support Students may benefit from drawing models of problems to see the ratios. Encourage students to use simple drawings or letters to stand for the quantities in the problems.

Use manipulatives, such as two-colored counters or different colored connecting cubes, to model problems.

Lesson Extension Have students identify ratios of objects in the classroom. For example, the number of dry-erase markers to the number of erasers. Ask: *Which of your ratios are part-to-part ratios? Which are part-to-whole ratios?*

1 GETTING THE IDEA

Lesson Opener

Read through the Getting the Idea part of the lesson, and discuss the definition of the word *ratio*. Ask: *What is a quantity? (an amount) What are some situations where you might need to compare quantities in relationship to each other? Use the ratios in the table to point out that the first number*

is listed in a ratio, or the numerator when it is written in fraction form, describes the first quantity mentioned in the ratio.

▲ **ELL Support** *In some countries, the colon (:) is also used to signify division. Discuss this notation with students during the introduction of ratios. Ask: How is division related to ratios? Make sure students understand they do not need to divide quantities in the ratios in this lesson.*

► Example 1

After working through Example 1, ask: *What is the ratio of right-handed batters to baseball players? (13:20) How is this ratio related to the ratio of left-handed batters to baseball players? (The team has a total of 20 players, so the whole in each ratio is the same. The sum of the parts is 20, which is equal to the total number of players.)*

▲ **Journal Prompt MP7** *Imagine that a new player joins the baseball team mentioned in Example 1. This player bats right-handed. How does this affect the ratio of left-handed batters to the number of players?*

► Example 2

Ask: *Is this a part-to-whole ratio, or a part-to-part ratio? How do you know? (It is part-to-part ratio because the problem asks to compare one type of sock to the other type of sock.)* Have students ask and answer a part-to-whole ratio question.

▲ **Common Error** *Make sure that students use the appropriate notation for the ratio when it is asked for in the problem. If students write the ratio using a different notation, have them reread the problem and explain how they can use what they have written to write the ratio in the specified way.*

► Example 3

After working through Step 2, ask: *Why do you need to add the red and yellow tulips in this step? (The problem asks for the ratio of the number of flowers to the number of tulips. It does not say only one color of tulips.)*

▲ **Common Error** *Students need to add in both Example 3 and the Coached Example. Make sure students understand which numbers they are adding in order to make the correct comparison.*

▲ **ELL Support** *To help them keep track of quantities in a problem, have students use different-colored pencils. For example, students could circle "15 are red tulips" in red, "13 are yellow tulips" in yellow, and "19 are daisies" in blue. Then have students write a description of the ratio using color to indicate the quantities they will use. They could describe the ratio for Example 3 as "all flowers to red tulips and yellow tulips" underlining "all flowers" with all 3 colors. They would underline "red tulips" in red and "yellow tulips" in yellow.*

2 COACHED EXAMPLE

Before starting the problem, ask what students know about the number of each type of bagel. Ask: *Why is it necessary to add the number of plain and everything bagels? (The problem asks for the ratio of plain or everything bagels to the total number of bagels.)*

To continue to assess student understanding, ask: *What kind of ratio is 8:11? (part-to-part) 8:19? (part-to-whole) Write a whole-to-part ratio using the information in the problem.*

For answers, see Appendix A.

3 LESSON PRACTICE

As students are working, pay attention to problem 12. Make sure that all students know that the "S" at the beginning of a week represents a Sunday and the "S" at the end of the week represents a Saturday. To assess student understanding of the concepts in this lesson,

have students describe what problem 13 is asking them to find. Have them explain how they will solve the problem.

For answers, see Appendix A.