TEACHER'S GUIDE **Overview** *continued*

i-Ready Classroom Mathematics lessons consist of three types of sessions: Explore, Develop, and Refine. The following is a walkthrough of the planning and support features within the Teacher's Guide for a Develop session. You will find many of the same features in the Explore and Refine sessions.

Lesson Overview provides information for use in planning whole class instruction, small group differentiation, and independent learning opportunities.

Content Objectives identify the mathematical learning goals for the lesson, while **Language Objectives** indicate the language students are expected to understand and produce as they work on those goals.

Prior Knowledge are opportunities to monitor understanding and identify students' learning needs.

Math Vocabulary is defined in the context of lessons, and academic words can be explored using the **Academic Vocabulary** Routine.

Learning Progression sets context for the mathematics of the lesson, providing information on how the content fits across and within grade levels—what students previously learned, what they are learning now, and what they will be learning next.

LESSON 13

Overview | Find Equivalent Ratios

STANDARDS FOR MATHEMATICAL PRACTICE (SMP)

SMP 1, 2, 3, 4, 5, and 6 are integrated into the Try-Discuss-Connect framework.*

This lesson provides additional support for:

2 Reason abstractly and quantitatively.

5 Use appropriate tools strategically.

* See page 1s to learn how every lesson includes these SMP.

Objectives

Content Objectives

- Identify and generate equivalent ratios using models, double number lines, and tables with addition and multiplication.
- Find missing values in tables of equivalent ratios.
- Solve problems with equivalent ratios.
- Generate ordered pairs from tables of equivalent ratios and plot them in the coordinate plane.

Language Objectives

- Demonstrate understanding of equivalent ratios by completing models and responding to written questions.
- Interpret word problems involving equivalent ratios by identifying the relationship among the quantities.
- Describe how to represent equivalent ratios on a coordinate plane using the lesson vocabulary.
- Ask clarifying questions to deepen understanding during partner and class discussions.

Prior Knowledge

- Understand what a ratio is, how to describe a ratio using ratio language, and that order in a ratio matters (*a* to *b* is not the same as *b* to *a*).
- Represent a ratio using a diagram.
- Plot ordered pairs and interpret coordinates of points in the context of a situation.

Vocabulary

Math Vocabulary

equivalent ratios two ratios that express the same comparison. Multiplying both numbers in the ratio $a : b$ by a nonzero number n results in the equivalent ratio $na : nb$.

Review the following key terms.

coordinate plane a two-dimensional space formed by two perpendicular number lines called axes.

ordered pair a pair of numbers, (x, y), that describes the location of a point in the coordinate plane. The x-coordinate gives the point's horizontal distance from the y-axis, and the y-coordinate gives the point's vertical distance from the x-axis.

***x*-axis** the horizontal number line in the coordinate plane.

***x*-coordinate** the first number in an ordered pair. It tells the point's horizontal distance from the y-axis.

***y*-axis** the vertical number line in the coordinate plane.

***y*-coordinate** the second number in an ordered pair. It tells the point's vertical distance from the x-axis.

Academic Vocabulary

graph (noun) a diagram that shows data or relationships between values or quantities.

graph (verb) to show something with a graph.

Learning Progression

In Grade 5, students extended their use of multiplication to scale a quantity, which means to increase or decrease by multiplying by a factor.

In the previous lesson, students were introduced to the concept of ratio, ratio notation, and ratio language. They compared quantities and examined relationships using ratios.

In this lesson, students merge their understanding of multiplication as scaling and ratio concepts to identify and generate equivalent ratios. Students find missing values in tables of equivalent ratios and solve problems using double number lines or tables. They represent ratios as ordered pairs and then graph them as points in the coordinate plane.

Later in Grade 6, students will use tables to compare ratios, and they will apply their understanding of ratio to the ideas of rate and unit rate. They will analyze relationships between dependent and independent variables using graphs.

In Grade 7, students will apply ratio reasoning to explore proportional relationships and calculate probabilities.

Pacing Guide session-by-session pacing is used to plan daily instruction and practice.

Additional Practice is for use as in-class small group work, after class work, or at-home learning.

LESSON 13

Overview

Pacing Guide

Items marked with are available on the **Teacher Toolbox**.

	MATERIALS	DIFFERENTIATION
SESSION 1 **Explore** Equivalent Ratios (35–50 min) • **Start** (5 min) • **Try It** (5–10 min) • **Discuss It** (10–15 min) • **Connect It** (10–15 min) • **Close: Exit Ticket** (5 min) Additional Practice (pages 283–284)	**Math Toolkit** connecting cubes, counters, grid paper Presentation Slides	**PREPARE** Interactive Tutorial **RETEACH or REINFORCE** Hands-On Activity **Materials** For each group: 25 two-color counters
SESSION 2 **Develop** Finding Equivalent Ratios (45–60 min) • **Start** (5 min) • **Try It** (10–15 min) • **Discuss It** (10–15 min) • **Connect It** (15–20 min) • **Close: Exit Ticket** (5 min) Additional Practice (pages 289–290)	**Math Toolkit** connecting cubes, counters, double number lines, grid paper Presentation Slides	**RETEACH or REINFORCE** Hands-On Activity **Materials** For each group: 24 two-color counters **REINFORCE** Fluency & Skills Practice **EXTEND** Deepen Understanding
SESSION 3 **Develop** Graphing a Table of Equivalent Ratios (45–60 min) • **Start** (5 min) • **Try It** (10–15 min) • **Discuss It** (10–15 min) • **Connect It** (15–20 min) • **Close: Exit Ticket** (5 min) Additional Practice (pages 295–296)	**Math Toolkit** connecting cubes, counters, double number lines, graph paper Presentation Slides	**RETEACH or REINFORCE** Hands-On Activity **Materials** For each pair: 24 two-color counters, Activity Sheet *Coordinate Plane: First Quadrant* **REINFORCE** Fluency & Skills Practice **EXTEND** Deepen Understanding
SESSION 4 **Develop** Using Equivalent Ratios (45–60 min) • **Start** (5 min) • **Try It** (10–15 min) • **Discuss It** (10–15 min) • **Connect It** (15–20 min) • **Close: Exit Ticket** (5 min) Additional Practice (pages 301–302)	**Math Toolkit** connecting cubes, counters, double number lines, graph paper Presentation Slides	**RETEACH or REINFORCE** Hands-On Activity **Materials** For each pair: 30 two-color counters **REINFORCE** Fluency & Skills Practice **EXTEND** Deepen Understanding
SESSION 5 **Refine** Finding Equivalent Ratios (45–60 min) • **Start** (5 min) • **Monitor & Guide** (15–20 min) • **Group & Differentiate** (20–30 min) • **Close: Exit Ticket** (5 min)	**Math Toolkit** Have items from previous sessions available for students. Presentation Slides	**RETEACH** Hands-On Activity **Materials** For each student: 30 two-color counters, Activity Sheet *Double Number Lines* **REINFORCE** Problems 4–8 **EXTEND** Challenge i-Ready **Personalized Instruction**
Lesson 13 Quiz or **Digital Comprehension Check**		**RETEACH** Tools for Instruction **REINFORCE** Math Center Activity **EXTEND** Enrichment Activity

Prepare students for the lesson content with *Interactive Tutorials*.

Reinforce understanding with *Fluency & Skills Practice*, *Apply It* problems, and differentiated *Math Center Activities*. *Hands-On Activities* and *Visual Models* may also be useful in reinforcing mathematical concepts.

Reteach mathematical concepts using *Hands-On Activities* and *Visual Models*. Tools for Instruction also provide targeted skills instruction.

Extend mathematical concepts with *Deepen Understanding*, *Challenge Activities*, and *Enrichment Activities*.

Optional Add-On: **Personalized Instruction** resources provide students with opportunities to strengthen grade-level skills by working on their personalized path.

The **Lesson Quiz** or **Digital Comprehension Check** assesses students' progress toward mastery of lesson content and is a way to identify where reteaching is needed.

TEACHER'S GUIDE **Overview** *continued*

Purpose provides a roadmap of what students will be learning and doing across the session.

Start establishes a clear and accessible entry point for each session, engaging students mathematically with prerequisite content. It frequently is an opportunity to have students engage in a math talk.

Develop Academic Language provides language support for all students and is especially useful in helping EL students use and produce academic language.

Support Partner Discussion provides teachers with prompts to help students engage in meaningful peer discourse.

Make Sense of the Problem uses a language routine to help students understand the problem. See the Language Routines section on the Teacher Toolbox (under the Program Implementation tab) for suggestions on how to integrate language routines, teacher moves, and conversation tips during instruction.

Common Misconception identifies misconceptions that lead to errors in understanding, which can then be addressed in whole class discussion as students are prompted to explain their reasoning.

LESSON 13 | SESSION 2 ■ ■ □ □ □

Develop Finding Equivalent Ratios

Purpose

- **Develop** strategies for generating equivalent ratios.
- **Recognize** that you can produce an equivalent ratio by multiplying both quantities in the ratio by the same nonzero number.

START CONNECT TO PRIOR KNOWLEDGE

Same and Different

3, 6, 9, 12, . . . 8, 16, 24, 32, . . .

A B C

24, 48, 72, 96, . . .

Possible Solutions

Each shows multiples of the first number in the list.

A shows multiples of 3.

B shows multiples of 8.

C shows multiples of 24, and 24 is also a common multiple of 3 and 8. So any number in C would also be in both A and B when you continue the pattern of multiples.

WHY? Support students' ability to recognize multiples of a number.

DEVELOP ACADEMIC LANGUAGE

WHY? Support students as they listen to understand a speaker's message.

HOW? Model for students ways to ask clarifying questions when they do not understand or ask for more information during a discussion. Use sentence frames such as: *Can you explain more about ____? What does ____ mean?* During class discussion, highlight and recognize when students ask classmates clarifying questions or ask for more information.

TRY IT

SMP 1, 2, 4, 5, 6

Make Sense of the Problem

See ***Connect to Culture*** to support student engagement. Before students work on Try It, suggest that they use **Three Reads**, asking themselves one of the following questions each time.

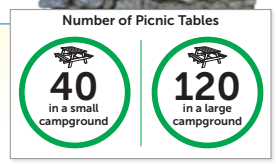
- *What is this problem about?*
- *What are you asked to find?*
- *What information is important in this problem?*

LESSON 13 | SESSION 2 ■ ■ □ □ □

Develop Finding Equivalent Ratios

➤ **Read and try to solve the problem below.**

The ratio of picnic tables to garbage cans in each campground of a new national park should be 8 : 3. The park design shows plans for picnic tables in a small campground and a large campground. How many garbage cans should be in each campground?



TRY IT

Math Toolkit connecting cubes, counters, double number lines, grid paper

Possible work:

SAMPLE A

Small Campground: Picnic Tables 8 8 8 8 8 8; Garbage Cans 3 3 3 3 3 3

Large Campground: Picnic Tables 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8; Garbage Cans 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3

The park should have 15 garbage cans in a small campground and 45 garbage cans in a large campground.

SAMPLE B

Small Campground	
Picnic Tables	Garbage Cans
8	3
16	6
24	9
32	12
40	15

Large Campground	
Picnic Tables	Garbage Cans
40	15
80	30
120	45

A small campground should have 15 garbage cans. A large campground should have 45 garbage cans.

DISCUSS IT

Ask: How did you use the ratio 8 : 3 to find the number of garbage cans for 40 picnic tables?

Share: I used the ratio 8 : 3 when I . . .

DISCUSS IT

SMP 2, 3, 6

Support Partner Discussion

After students work on Try It, encourage them to respond to Discuss It with a partner. If students need support in getting started, prompt them to ask each other questions such as:

- *How are you keeping track of the information for small and large campgrounds?*
- *How does your model show the ratio 8 : 3?*

Common Misconception Listen for students who think there should be 35 garbage cans in the small campground or 115 in the large campground. They may be think there should be a difference of 5 between the number of picnic tables and garbage cans. As students share their strategies, elicit discussion of what equivalent ratios mean. Encourage students to draw a picture to prove their ratios of tables to garbage cans are equivalent to the given ratio 8 : 3. Ask students how they know their ratios are equivalent. Listen for students who explain how their models show 8 tables for every 3 garbage cans.

Select and Sequence Student Strategies

Select 2–3 samples that represent the range of student thinking in your classroom. Here is one possible order for class discussion:

- drawing equal groups that represent 8 : 3
- **(misconception)** assuming there should always be a difference of 5 between the number of picnic tables and garbage cans because $8 - 3 = 5$
- using tables or double number lines and ratio reasoning to determine equivalent ratios

Facilitate Whole Class Discussion

Call on students to share selected strategies. After agreeing with a student's statement, add details that add to the idea or increase other students' understanding of the statement.

Allow students time to think by themselves, and then guide students to **Compare and Connect** the representations. Prompt students to connect each representation to the number of picnic tables and garbage cans in the small and large campground.

ASK *How does [student name]'s model show equivalent ratios?*

LISTEN FOR Representations may show equivalent ratios as models of 8 picnic tables and 3 garbage cans, as rows of a table, or as corresponding values on a double number line.

Model It

If students presented these models, have students connect these models to those presented in class.

If no student presented at least one of these models, have students first analyze key features of the models, and then connect them to the models presented in class.

ASK *How is it possible for these two models to show equivalent ratios if one uses addition and the other uses multiplication?*

LISTEN FOR The double number line uses repeated addition. The table uses multiplication, which is the same as repeated addition.

For the double number line, prompt students to think about how addition is used to generate equivalent ratios.

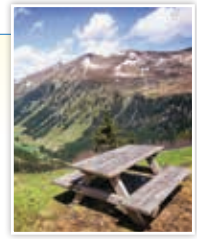
- *Why is 8 added to get the quantities for the top number line but not for the bottom number line?*
- *What numbers are added to find the quantity of garbage cans when there are 40 picnic tables?*

For the table, prompt students to describe how multiplication can be used to complete the table.

- *What can you multiply 8 by to get 40? To get 120? How does this help you solve the problem?*

➤ **Explore different ways to find equivalent ratios.**

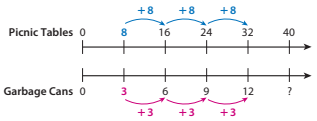
The ratio of picnic tables to garbage cans in each campground of a new national park should be 8 : 3. The park design shows plans for 40 picnic tables in a small campground and 120 picnic tables in a large campground. How many garbage cans should be in each campground?



Model It

You can use addition to find equivalent ratios.

One way to show adding groups of **8 picnic tables** for every **3 garbage cans** is with a double number line.

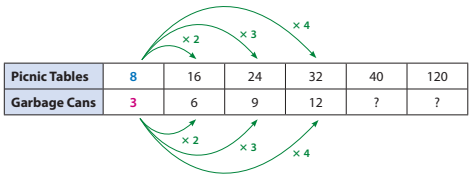


You can write ratios for number pairs that line up vertically. The double number line shows the equivalent ratios 8 : 3, 16 : 6, 24 : 9, and 32 : 12.

Model It

You can use multiplication to find equivalent ratios.

You can record equivalent ratios in a table.



Picnic Tables	8	16	24	32	40	120
Garbage Cans	3	6	9	12	?	?

DIFFERENTIATION | EXTEND

SMP 2

Deepen Understanding

Making Sense of Quantities and the Relationships Between Them

Prompt students to focus on the relationship between the quantities by changing the numbers in the problem. Then have them use those numbers within the context of the problem to visualize how the models would reflect these changes.

ASK *How would the number of garbage cans change if the number of picnic tables at the small campground is doubled? How many picnic tables and garbage cans would there be?*

LISTEN FOR There would be twice as many picnic tables, so there would be twice as many garbage cans. Both quantities would be multiplied by 2. There would be 80 picnic tables and 30 garbage cans.

ASK *How would the number of picnic tables change if one-fifth of the number of garbage cans is needed at the large campground? How many picnic tables and garbage cans would there be?*

LISTEN FOR Only one-fifth of the number of picnic tables is needed. There would be 24 picnic tables and 9 garbage cans.

Ask/Listen for are mathematical discourse questions followed by expected student responses that support and facilitate whole class discussion.

As students share their thinking, the discourse questions can be used to make connections between student approaches and different models and representations, prompt justifications and critiques of approaches and solutions, and check conceptual understanding.

Standards for Mathematical Practice (SMP) are infused throughout the instructional model.

Deepen Understanding is a consistent opportunity to build conceptual understanding of a key lesson concept by extending mathematical discourse. The content connects a particular aspect of lesson learning to an SMP, showing how it looks in the classroom.

TEACHER'S GUIDE **Overview** *continued*

Monitor and Confirm Understanding is a way to ensure that students have made sense of mathematical learning goals.

Facilitate Whole Class Discussion provides a series of related discourse questions that illuminate the mathematical ideas of the lesson, prompting students to make connections and use that understanding to solve problems leading to abstract reasoning. These questions help students learn how to articulate a generalization of the mathematical concept.

Hands-On Activities occur consistently at strategic points in the lesson after teachers have acquired understanding of students' learning through observation and their work on questions in the Student Worktext. The activities support students who are unsure of the concept and are an opportunity for small group reteaching while other students work independently. Use of concrete objects lets students access understanding in a different way.

LESSON 13 | SESSION 2 ■ ■ □ □ □

Develop Finding Equivalent Ratios

CONNECT IT

SMP 2, 4, 5, 6

Remind students that the ratios of picnic tables to garbage cans are the same in each representation. Explain that they will now use those models to find equivalent ratios.

Before students begin to record and expand on their work in Model It, tell them that problem 3 will prepare them to provide the explanation asked for in problem 4.

Monitor and Confirm Understanding 1 – 2

- The ratios in the double number line are equivalent to 8 : 3 because groups of 8 picnic tables and 3 garbage cans are added to find the next number pair.
- Using double number lines and tables can help you use ratio reasoning to find equivalent ratios.

Facilitate Whole Class Discussion

3 Look for the idea that you can use repeated addition of the quantities in a ratio to find equivalent ratios, and that multiplication is another way to show repeated addition.

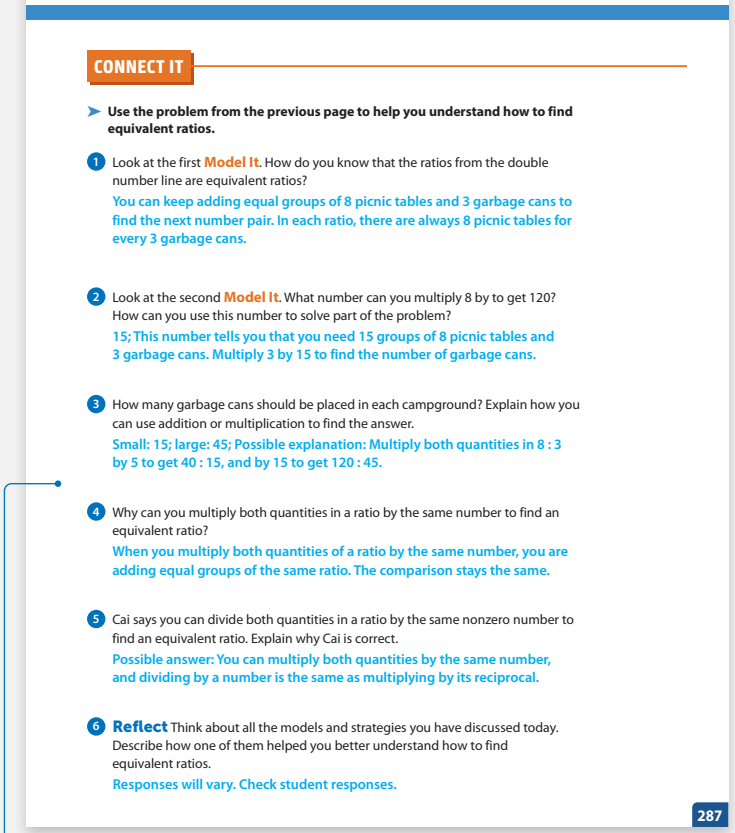
> **ASK** *What number can you multiply by to find your answer? What numbers can you repeatedly add to find your answer?*
>
> **LISTEN FOR** For the small campground, you can multiply each quantity by 5 or you can add 8 five times and add 3 five times. For the large campground, you can multiply each quantity by 15 or you can add 8 fifteen times and add 3 fifteen times.

4 Look for understanding that you can use either addition or multiplication when finding equivalent ratios.

> **ASK** *How can you use either addition or multiplication to find the number of garbage cans in each campground?*
>
> **LISTEN FOR** To make another equal group, you can use repeated addition for each quantity, which is the same as multiplying each quantity in the ratio by the same number.

5 Students may recognize that dividing by a number is the same as multiplying by its reciprocal, so equivalent ratios can also be found by dividing both quantities by the same nonzero number.

6 **Reflect** Have all students focus on the strategies used to solve the Try It. If time allows, have students discuss their ideas with a partner.



CONNECT IT

➤ **Use the problem from the previous page to help you understand how to find equivalent ratios.**

1 Look at the first **Model It**. How do you know that the ratios from the double number line are equivalent ratios?
You can keep adding equal groups of 8 picnic tables and 3 garbage cans to find the next number pair. In each ratio, there are always 8 picnic tables for every 3 garbage cans.

2 Look at the second **Model It**. What number can you multiply 8 by to get 120? How can you use this number to solve part of the problem?
15; This number tells you that you need 15 groups of 8 picnic tables and 3 garbage cans. Multiply 3 by 15 to find the number of garbage cans.

3 How many garbage cans should be placed in each campground? Explain how you can use addition or multiplication to find the answer.
Small: 15; large: 45; Possible explanation: Multiply both quantities in 8 : 3 by 5 to get 40 : 15, and by 15 to get 120 : 45.

4 Why can you multiply both quantities in a ratio by the same number to find an equivalent ratio?
When you multiply both quantities of a ratio by the same number, you are adding equal groups of the same ratio. The comparison stays the same.

5 Cai says you can divide both quantities in a ratio by the same nonzero number to find an equivalent ratio. Explain why Cai is correct.
Possible answer: You can multiply both quantities by the same number, and dividing by a number is the same as multiplying by its reciprocal.

6 **Reflect** Think about all the models and strategies you have discussed today. Describe how one of them helped you better understand how to find equivalent ratios.
Responses will vary. Check student responses.

287

DIFFERENTIATION | RETEACH or REINFORCE

Hands-On Activity

Use repeated addition and multiplication to form equivalent ratios.

If students are unsure about finding equivalent ratios using multiplication, then use this activity to connect multiplication to repeated addition.

Materials For each group: 24 two-color counters

- Give counters to each group and have them use 8 counters to make a row of red counters and a row of yellow counters in a 6 to 2 ratio. Ask: *How do you know your model is correct?* [There are 6 red counters and 2 yellow counters.]
- Have students add 6 red counters and 2 yellow counters to the existing group. Ask: *What is the ratio of red counters to yellow counters now?* [12 : 4] *Describe how to find this ratio using multiplication.* [Multiply each quantity in the ratio 6 : 2 by 2.]
- Repeat using a third set of counters. Have students describe how to use multiplication to find another ratio equivalent to 6 : 2. [Multiply each quantity in 6 : 2 by 3 to get 18 : 6.]
- Ask: *Suppose you wanted to add another group of 6 red counters and 2 yellow counters. How could you determine the ratio of counters in the entire collection based on the original ratio by using multiplication?* [Multiply both 6 and 2 by 4.]

287 LESSON 13 Find Equivalent Ratios

Apply It solutions at point of use give a correct response with explanations that include multiple approaches to solving the problem.

Apply It

For all problems, encourage students to use a model to support their thinking. Allow some leeway in precision; drawing number lines with equal spacing between tick marks can be difficult, and precise measures are not necessary to determine a solution to the problem.

7 Ensure students understand that having the *same ratio* of blue beads to purple beads does not mean that the bracelet has the same number of blue beads and purple beads as the necklace.

- **B** **is correct.** Students may divide 24 by 4 to get 6 and then divide 32 by 4 to find the number of purple beads Hailey should use.
- **A** is not correct. This answer is the result of dividing the number of blue beads in the necklace by 6 instead of the number of purple beads by 4.
- **C** is not correct. This answer is the result of adding 8 to the number of blue beads for the bracelet.
- **D** is not correct. This answer is the result of subtracting 6 from the number of blue beads in the necklace, 24.

8 Students may recognize that Kareem added the same value, 8, to each number in the ratio.

Apply It

➤ **Use what you learned to solve these problems.**

7 Hailey makes a necklace with 24 blue beads and 32 purple beads. She wants to make a bracelet that has the same ratio of blue beads to purple beads as the necklace. She plans to use 6 blue beads for the bracelet. How many purple beads should Hailey use?

A 4 purple beads

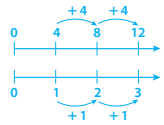
(B) 8 purple beads

C 14 purple beads

D 18 purple beads

8 Kareem says that the ratio 4 : 1 is equivalent to the ratio 12 : 9 because 4 + 8 = 12 and 1 + 8 = 9. Is Kareem correct? Explain how you know.

No; Possible explanation: The double number line shows that 4 : 1 is equivalent to 12 : 3, not 12 : 9.



9 The table shows that Marta's heart beats 18 times every 15 s. Use equivalent ratios to complete the table. Explain how you found the time in seconds for 180 heartbeats.

Marta's Heartbeats	
Time (s)	Number of Beats
15	18
30	36
45	54
150	180

See table; Possible explanation: You can go from 18 to 180 by multiplying by 10. To find an equivalent ratio, you need to multiply 15 by 10.

CLOSE EXIT TICKET

9 Students' solutions should show an understanding of:

- equivalent ratios as ratios that name the same multiplicative comparison.
- finding equivalent ratios by multiplying each quantity in the ratio by the same number.

Error Alert If students write 60 as the missing time, then explain that the missing time must form a ratio with second quantity 180 that is equivalent to 15 : 18. Have students compare the number of beats in the original ratio to the quantity 180 heartbeats.

Close: Exit Ticket is a quick formative assessment of each day's learning and serves as an indicator of students' progress toward mastery or partial mastery of the learning goal of the session.

This is the last question on the Student Worktext page.

Error Alert gives insight into misconceptions that can lead to errors in calculation and provides on-the-spot remediation.

TEACHER'S GUIDE **Overview** *continued*

Additional Practice can be used as in-class small group work, after class work, or at-home learning.

Solutions are labeled as *Basic*, *Medium*, and *Challenge* to show the relative difficulty level in relation to the questions at hand or the standard in question. Use these to support independent practice or differentiation as needed.

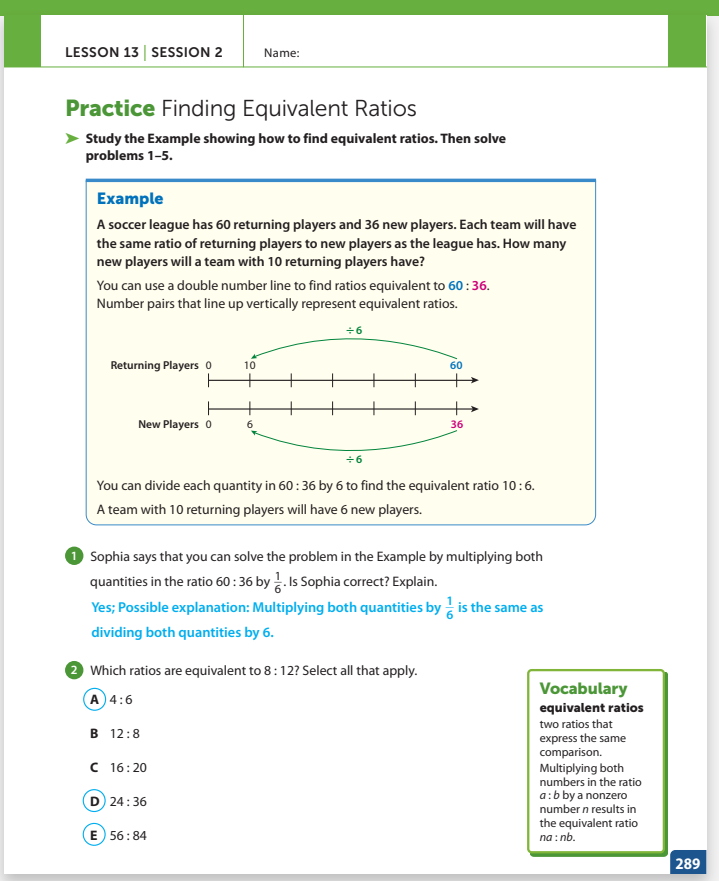
LESSON 13 | SESSION 2 ■ ■ □ □ □

Practice Finding Equivalent Ratios

Problem Notes

Assign **Practice Finding Equivalent Ratios** as extra practice in class or as homework.

1. Students should recognize dividing as the same as multiplying by the reciprocal and understand that either method can be used to find an equivalent ratio. ***Basic***
2. **A, D, and E are correct.** Students may solve the problem by multiplying or dividing each number in the ratio 8 : 12 by the same number.
   - **B** is not correct. This answer is the given ratio listed in a different order.
   - **C** is not correct. This answer is found by adding 8 to each value in the ratio 8 : 12. ***Basic***



LESSON 13 | SESSION 2 Name:

Practice Finding Equivalent Ratios

➤ **Study the Example showing how to find equivalent ratios. Then solve problems 1–5.**

Example

A soccer league has 60 returning players and 36 new players. Each team will have the same ratio of returning players to new players as the league has. How many new players will a team with 10 returning players have?

You can use a double number line to find ratios equivalent to 60 : 36. Number pairs that line up vertically represent equivalent ratios.

You can divide each quantity in 60 : 36 by 6 to find the equivalent ratio 10 : 6.

A team with 10 returning players will have 6 new players.

1. Sophia says that you can solve the problem in the Example by multiplying both quantities in the ratio 60 : 36 by $\frac{1}{6}$. Is Sophia correct? Explain.
   Yes; Possible explanation: Multiplying both quantities by $\frac{1}{6}$ is the same as dividing both quantities by 6.
2. Which ratios are equivalent to 8 : 12? Select all that apply.
   - **A** 4 : 6
   - **B** 12 : 8
   - **C** 16 : 20
   - **D** 24 : 36
   - **E** 56 : 84

Vocabulary
equivalent ratios two ratios that express the same comparison. Multiplying both numbers in the ratio $a : b$ by a nonzero number n results in the equivalent ratio $na : nb$.

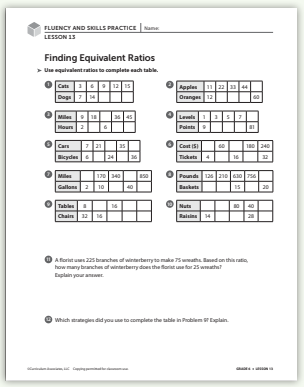
289

Fluency & Skills Practice provides ongoing opportunities for students to accurately, flexibly, and efficiently practice mathematical procedures and operations. This can be used as in-class small group work, after-class work, or at-home learning. Student pages are available in the optional Fluency and Skills Practice Book or on Teacher Toolbox. Download PDFs or editable versions, or assign to any LMS, including Google Classroom.

Fluency & Skills Practice

Finding Equivalent Ratios

In this activity, students use equivalent ratios to complete tables and to solve a real-world problem.



FLUENCY AND SKILLS PRACTICE | Name:
LESSON 13

Finding Equivalent Ratios

➤ Use equivalent ratios to complete each table.

1. Cats 3 6 9 12 15 / Dogs 7 14
2. Apples 11 22 33 44 / Oranges 12 60
3. Miles 9 18 36 45 / Hours 2 8
4. Levels 1 3 5 7 9 / Points 3 21
5. Cars 7 21 35 / Bicycles 4 24 36
6. Cost ($) 40 160 240 / Tickets 4 16 32
7. Miles 170 340 850 / Gallons 2 10 40
8. Pounds 126 210 630 756 / Baskets 15 20
9. Tables 8 16 / Chairs 32 16
10. Nuts 80 40 / Raisins 14 28

11. A florist uses 225 branches of winterberry to make 75 wreaths. Based on this ratio, how many branches of winterberry does the florist use for 25 wreaths? Explain your answer.
12. Which strategies did you use to complete the table in Problem 9? Explain.

©Curriculum Associates, LLC Copying permitted for classroom use. GRADE 6 • LESSON 13

Learning Games


Match


Pizza


Cupcake

Interactive Practice
Assign your students additional digital practice, as needed.

Cumulative Practice
Assign Cumulative Practice to review major content from previous units, as needed.

i-Ready Personalized Instruction
A personalized instruction path helps students reinforce prerequisites and build grade-level skills.

Additional Practice Opportunities include digital Learning Games, Interactive Practice, Cumulative Practice, and i-Ready Personalized Instruction.

289 **LESSON 13** Find Equivalent Ratios

LESSON 13 | SESSION 2

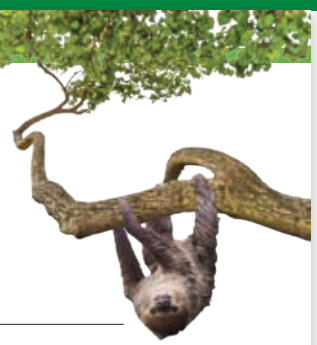
Additional Practice

3 Students may also use a table or repeated addition to write equivalent ratios. ***Medium***

4 **a.** Students may use ratio reasoning or multiplication to find equivalent ratios. ***Medium***

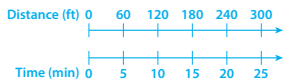
b. Students may divide 63 by 7 to get 9, and then multiply 9 by 1 to find the number of adults. ***Medium***

5 Students may also multiply the number of small T-shirts and large T-shirts by 6 to find the quantities the manager should order. ***Challenge***



3 A football field is 300 ft long. A sloth moving very quickly travels 60 ft every 5 min. Based on this ratio, how many minutes would it take a sloth to travel the length of a football field? Show your work.

Possible work:



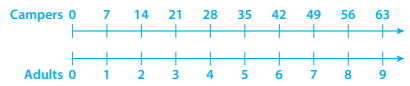
SOLUTION It would take the sloth 25 min.

4 At a summer camp, the ratio of campers to adults is kept equivalent to 7 : 1.

a. Use equivalent ratios to complete the table.

Campers	7	14	28	210
Adults	1	2	4	30

b. Next week, there will be 63 campers. How many adults should the camp have next week? Show your work. Possible work:



SOLUTION The camp should have 9 adults.

5 A manager of a clothing store always orders 2 small T-shirts and 3 large T-shirts for every 4 medium T-shirts. The manager plans to order 24 medium T-shirts. How many small T-shirts and large T-shirts should the manager order? Show your work.

Possible work:

Small T-Shirts	2	4	6	8	10	12
Medium T-Shirts	4	8	12	16	20	24
Large T-Shirts	3	6	9	12	15	18

SOLUTION The manager should order 12 small shirts and 18 large shirts.

DIFFERENTIATION | ENGLISH LEARNERS

Use with **Session 3** Connect It

Levels 1–3: Speaking/Writing

Prepare students to respond in writing to Connect It problem 4. Read the problem aloud. Point out that the question is about finding equivalent ratios using a point in a coordinate plane. Ask students to tell which Model It connects to the problem. Provide think time for students to consider how the Model It graph can help them answer the question. Begin a **Co-Constructed Word Bank** with the terms *coordinate plane* and *equivalent ratios*, and prompt students to suggest additional words to discuss the problem. Guide them to include *ordered pairs, x-coordinate,* and *y-coordinate*. Then help students write explanations in short sentences using precise language.

Levels 2–4: Speaking/Writing

Prepare students to respond in writing to Connect It problem 4. Read the problem with students. Call on volunteers to rephrase the question.

Have students work with a partner to identify which Model It connects to the problem. Ask partners to list at least three important terms that might be used in their responses. Compile the responses into a **Co-Constructed Word Bank**.

Ask partners to take turns explaining the steps to finding equivalent ratios on graphs. Remind them to use terms from the word bank. Then have students draft their responses individually using precise language. Allow time for partners to give feedback and make corrections.

Levels 3–5: Speaking/Writing

Prepare students to respond in writing to Connect It problem 4. Have students read the problem and discuss what the question is asking. Have partners make a **Co-Constructed Word Bank** of terms they can use to discuss and write about the problem. Allow time for partners to discuss, and then compile the terms into a class word bank.

Have students draft a written response using words from the word bank. Have them use **Stronger and Clearer Each Time** to get feedback from a partner and revise their explanations. Encourage partners to discuss how the explanation was strengthened by precise language.

DIFFERENTIATION | ENGLISH LEARNERS helps teachers scaffold or amplify language in the next session so English learners can access and engage with grade-level mathematics.