Ratios and Measurement

Lesson 12 Explaining Conversion Ratios

Standards 6.RP.A.3d

Learning target I can convert measurements using equivalent ratios.

Materials Counters, tape-diagram space, rulers, measurement conversion chart, graph paper.

Lesson Flow 50 Minutes

0–5 Activate prior knowledge. Read the learning target. Ask students what they already know about explaining conversion ratios. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Write an equality such as 1 foot = 12 inches. Multiply to change larger units into smaller units; divide for the reverse. A conversion factor is a ratio equal to 1, so the amount stays the same. Work through the two examples on the attached instruction page. Have students name the first step before showing it.

17–22 Guided practice. Revisit worked Example 2 with its solution covered. Students propose the next step and explain why it is valid; uncover and compare with the worked solution.

22–45 Independent classwork. Assign the attached 10 questions in order. Check items 1–3 for entry-level understanding, 4–6 for connected procedures, 7–8 for representation and explanation, and 9–10 for application or justification. Ask students to use the instruction-page notes area or extra grids for longer work.

45–50 Check understanding. Use classwork question 10 as an exit discussion: Convert 150 centimeters to meters. Show the conversion ratio. Compare the result with the answer key and ask a student to defend the method.

Support and Extension

Support Model item 1 together with the listed tools, then have students attempt item 2 independently. Watch the order of ratio labels, part-to-whole denominators, and scaling only one quantity.

Extension Ask students to solve a final item another way, draw a second representation, or create a related problem with a checked answer.

Next step Record which students can explain the target independently. Begin the next teaching session with a brief correction for any recurring error.

Name _____ Date _____

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Learn and Discuss

Write an equality such as 1 foot = 12 inches. Multiply to change larger units into smaller units; divide for the reverse. A conversion factor is a ratio equal to 1, so the amount stays the same.

Example 1 Convert 4 hours to minutes. Show the conversion ratio.
Solution 240 minutes. 4 × 60 = 240. Smaller units require more units for the same amount.
Example 2 Convert 400 centimeters to meters. Show the conversion ratio.
Solution 4 meters. 400 ÷ 100 = 4; 1 meters = 100 centimeters.

Classwork Show Your Work

Complete the 10 problems on the following page. Refer to the examples, draw models, and check your results.

My Notes or Second Method

Lesson 12 Explaining Conversion Ratios

Name _____ Show calculations, models, and units.

1. Convert 7 feet to inches. Show the conversion ratio.

2. Convert 7 liters to milliliters. Show the conversion ratio.

3. Convert 2 yards to feet. Show the conversion ratio.

4. Convert 180 minutes to hours. Show the conversion ratio.

5. Convert 4 hours to minutes. Show the conversion ratio.

6. Convert 2000 milliliters to liters. Show the conversion ratio.

7. Convert 7/2 feet to inches. Show the conversion ratio and explain why the numerical value grows.

8. Convert 120 minutes to hours. Show the conversion ratio.

9. Convert 1 yards to feet. Show the conversion ratio and explain why the numerical value grows.

10. Convert 150 centimeters to meters. Show the conversion ratio.

Explaining Conversion Ratios

Ratios and Measurement

1. 84 inches
Reasoning 7 × 12 = 84. Smaller units require more units for the same amount.

2. 7000 milliliters
Reasoning 7 × 1000 = 7000. Smaller units require more units for the same amount.

3. 6 feet
Reasoning 2 × 3 = 6. Smaller units require more units for the same amount.

4. 3 hours
Reasoning 180 ÷ 60 = 3; 1 hours = 60 minutes.

5. 240 minutes
Reasoning 4 × 60 = 240. Smaller units require more units for the same amount.

6. 2 liters
Reasoning 2000 ÷ 1000 = 2; 1 liters = 1000 milliliters.

7. 42 inches
Reasoning 7/2 × 12 = 42. Smaller units require more units for the same amount.

8. 2 hours
Reasoning 120 ÷ 60 = 2; 1 hours = 60 minutes.

9. 3 feet
Reasoning 1 × 3 = 3. Smaller units require more units for the same amount.

10. 3/2 meters
Reasoning 150 ÷ 100 = 3/2; 1 meters = 100 centimeters.