First 5 Minutes — Review Question

GRADE 6 • TOPIC 5 • LESSON 5.9 | 5 points • Work independently

Lesson 5.9 • Ratio Reasoning: Convert Metric Units

Convert 48 inches to feet.

1. Show each step in your notebook.
2. Explain the operation or rule you used.

Real-Life Connection & Key Concepts

Essential question

How can ratios convert metric units of measure?

Solve & Discuss It!

Sam fills a 5-liter water jug with a 250-mL bottle. How many times must he fill the bottle?

What we will learn

Use metric conversion factors for length, capacity, and mass; explain and check the direction of conversion.

Definitions & rules

Metric units scale by powers of 10.

1 km = 1,000 m; 1 m = 100 cm = 1,000 mm.

1 L = 1,000 mL; 1 kg = 1,000 g; 1 g = 1,000 mg. Use factors to cancel units.

Example 1 — Metric Unit Conversions

Problem

Emelia cuts a 1.2-meter board for a skate ramp. The diagram labels the height as 120 cm. Is the measurement correct?

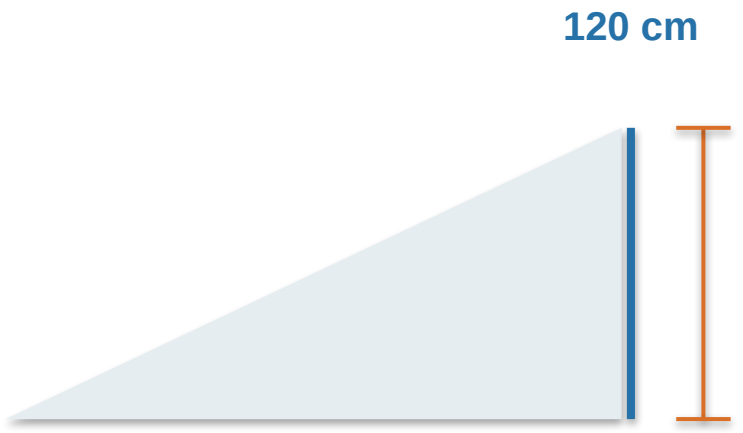
Worked solution

1 m = 100 cm.

$1.2 \text{ m} \times \left(\frac{100 \text{ cm}}{1 \text{ m}}\right) = 120 \text{ cm}.$

Yes, the board is the correct length.

Use powers of ten; write the conversion factor so the original unit cancels.



Back board: 1.2 m

Example 2 — Metric Unit Conversions

GRADE 6 • TOPIC 5 • LESSON 5.9 | Guided example • Model and explain

Problem

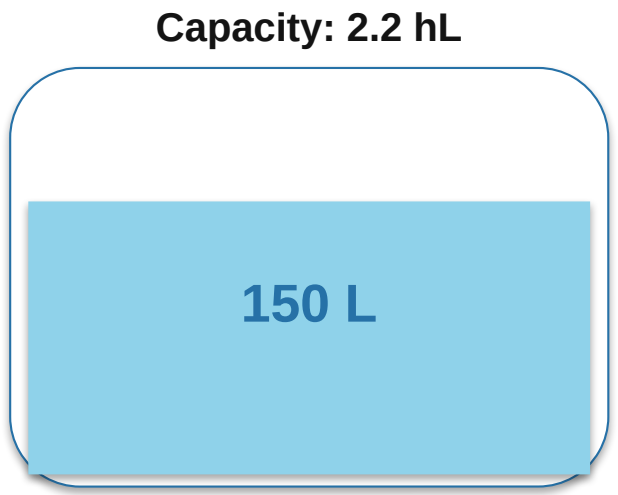
Raji poured 150 L into an aquarium with a total capacity of 2.2 hL. How many more liters are needed?

Worked solution

$2.2 \text{ hL} \times \left(\frac{100 \text{ L}}{1 \text{ hL}}\right) = 220 \text{ L}.$

$220 - 150 = 70 \text{ L}$ more water.

Use powers of ten; write the conversion factor so the original unit cancels.



Example 3 — Metric Unit Conversions

Problem

Lyle has 0.8 kg of salt and removes 850 cg. How much salt remains, in centigrams?

Worked solution

1 kg = 1,000 g = 100,000 cg.

0.8 kg = 80,000 cg.

80,000 − 850 = 79,150 cg.

Use powers of ten; write the conversion factor so the original unit cancels.

Individual Work

GRADE 6 • TOPIC 5 • LESSON 5.9 | 10 minutes total • 10 points

Complete all five tasks. Show your reasoning.

9. (p. 325) Convert 4 m to cm.

10. (p. 325) Convert 800 mL to L.

11. (p. 325) Convert 200 cL to L.

Individual Work — continued

GRADE 6 • TOPIC 5 • LESSON 5.9 | 10 minutes total • 10 points

Finish the remaining problems. Check your work.

12. (p. 325) Convert 2.5 kg to g.

13. (p. 325) Convert 80 cm to m.

Individual Work — Answer Key

GRADE 6 • TOPIC 5 • LESSON 5.9 | Check your answers

Use powers of ten; write the conversion factor so the original unit cancels.

9. (p. 325)

$4\ \text{m} \times 100\ \text{cm/m} = 400\ \text{cm}.$

10. (p. 325)

$800\ \text{mL} \times \frac{1\ \text{L}}{1{,}000\ \text{mL}} = 0.8\ \text{L}.$

11. (p. 325)

$200\ \text{cL} \times \frac{1\ \text{L}}{100}\ \text{cL} = 2\ \text{L}.$

12. (p. 325)

$2.5\ \text{kg} \times 1{,}000\ \text{g/kg} = 2{,}500\ \text{g}.$

13. (p. 325)

$80\ \text{cm} \times \frac{1\ \text{m}}{100\ \text{cm}} = 0.8\ \text{m}.$

Group Work

GRADE 6 • TOPIC 5 • LESSON 5.9 | 8 minutes total • 10 points

Work together. Each person must contribute a solution.

18. (p. 326) An object measures about 22 cm. What is its length in millimeters?

19. (p. 326) Explain why 1 kg equals 1,000,000 mg.

Group Work — continued

GRADE 6 • TOPIC 5 • LESSON 5.9 | 8 minutes total • 10 points

Agree on a solution and be ready to explain it.

20. (p. 326) A route is 31.5 km; 14,300 m was traveled before lunch. How far remains after lunch?

21. (p. 326) 35 objects have a mass of 5.67 g each. Find their total mass in kilograms.

Group Work — Answer Key

GRADE 6 • TOPIC 5 • LESSON 5.9 | Discuss and justify

Use powers of ten; write the conversion factor so the original unit cancels.

18. (p. 326)

22 cm × 10 mm/cm ≈ 220 mm.

19. (p. 326)

Yes: 1 kg = 1,000 g and 1 g = 1,000 mg, so 1,000,000 mg.

20. (p. 326)

14,300 m = 14.3 km. 31.5 − 14.3 = 17.2 km after lunch (or 17,200 m).

21. (p. 326)

35 × 5.67 = 198.45 g = 0.19845 kg.

Exit Ticket

GRADE 6 • TOPIC 5 • LESSON 5.9 | 2 minutes • Independent check

Before you leave, solve this problem.

Convert 0.0045 km to centimeters.

Show your work.

Write the answer with the correct units or graph, if needed.