



SKILL 20: Converting Between Measurement Systems

You have learned to convert units within the metric system or the U.S. Customary system. For some tasks, however, it is necessary to convert from one system to the other. The table at the right shows some of the common conversion factors for converting units from one system to the other.

Conversion Factors

Length

$$1 \text{ in.} = 2.54 \text{ cm}$$

$$1 \text{ km} \approx 0.62 \text{ mi}$$

Area

$$1 \text{ in}^2 \approx 6.45 \text{ cm}^2$$

Volume

$$1 \text{ in}^3 \approx 16.39 \text{ cm}^3$$

Capacity

$$1 \text{ L} \approx 1.06 \text{ qt}$$

Weight

$$1 \text{ oz} \approx 28 \text{ g}$$

$$1 \text{ kg} \approx 2.2 \text{ lb}$$

Example 1

Convert 30 in. to the nearest centimeter.

Use $\frac{2.54 \text{ cm}}{1 \text{ in.}}$ as the conversion factor, since you are converting to centimeters.

$$30 \text{ in.} = \frac{30 \cancel{\text{in.}}}{1} \times \frac{2.54 \text{ cm}}{1 \cancel{\text{in.}}}$$

Cancel matching units.

$$= (30 \times 2.54) \text{ cm}$$

Simplify.

$$= 76.2 \text{ cm} \approx 76 \text{ cm}$$

Multiply. Round to a whole number.

So, 30 in. is about 76 cm.

Example 2

Convert 25 qt to the nearest liter.

Multiply by the conversion factor $\frac{1 \text{ L}}{1.06 \text{ qt}}$, since you are converting to liters.

$$25 \text{ qt} \approx \frac{25 \cancel{\text{qt}}}{1} \times \frac{1 \text{ L}}{1.06 \cancel{\text{qt}}}$$

Cancel matching units.

$$\approx \frac{25 \text{ L}}{1.06}$$

Simplify.

$$\approx 23.58 \text{ L} \approx 24 \text{ L}$$

Divide. Round to a whole number.

So, 25 qt is about 24 L.

Guided Practice

1. Convert 15 kg to the nearest pound.

a. What conversion factor will you use?

b. Complete the calculations for the conversion.

$$15 \text{ kg} \approx \frac{\boxed{}}{1} \times \frac{\boxed{}}{\boxed{}}$$

$$\approx (\underline{} \times \underline{}) \text{ lb}$$

$$\approx \underline{} \text{ lb}$$

2. How many miles long is a 5 km race? Give your answer to the nearest mile.

a. $5 \text{ km} \approx \frac{\boxed{}}{1} \times \frac{\boxed{}}{\boxed{}}$

b. $5 \text{ km} \approx \underline{} \text{ mi}$

SKILL 20: Practice

Convert each measure. Round to the nearest unit.

1. 12 in. \approx _____ cm 2. 500 g \approx _____ oz 3. 26 oz \approx _____ g
 4. 50 cm \approx _____ in. 5. 15 lb \approx _____ kg 6. 25 kg \approx _____ lb
 7. 100 km \approx _____ mi 8. 55 mi \approx _____ km 9. 18 L \approx _____ qt
 10. 10 in³ = _____ cm³ 11. 100 in³ \approx _____ cm³ 12. 65 cm³ \approx _____ in³

Which of the two measurements is greater?

13. 200 km or 150 mi _____ 14. 45 in. or 100 cm _____
 15. 24 L or 24 qt _____ 16. 750 g or 16 oz _____

Solve. Round to the nearest unit.

17. How many quarts are there in five 2-liter bottles? _____
 18. If you drive 90 kilometers in an hour, how many miles have you driven? _____
 19. A recipe calls for 450 grams of flour.
 a. How many ounces of flour is this? _____
 b. How many pounds of flour is this? _____
 20. A 52-inch square tablecloth is big enough to cover Mary's table. She found a tablecloth on sale that is a 140-centimeter square. Is the tablecloth big enough to cover Mary's table? Why? _____

TEST PREP

21. Convert 20 in. to the nearest centimeter. Use 1 in. = 2.54 cm. *Skill 20*
 A 508 cm C 8 cm
 B 51 cm D 7 cm

22. The water in a glass has a mass of 90 g. How many liters of water does the glass contain? *Skill 19*
 F 90 L H 0.9 L
 G 9 L J 0.09 L