



## SKILL 19: Connecting Volume, Mass, and Capacity

One liter fills  $1,000 \text{ cm}^3$  of space. In science, you learn that the mass of  $1 \text{ cm}^3$  of water is 1 g (1 gram).

### Example

**What is the mass of the water that the aquarium can hold?**

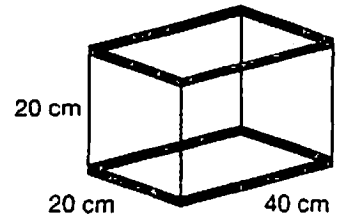
**Step 1:** Find the volume.

$$20 \text{ cm} \times 20 \text{ cm} \times 40 \text{ cm} = 16,000 \text{ cm}^3$$

**Step 2:** Change  $\text{cm}^3$  to mL.

$1 \text{ cm}^3$  holds 1 mL.

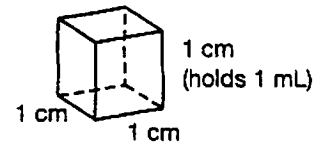
So,  $16,000 \text{ cm}^3$  holds 16,000 mL.



**Step 3:** Change mL to g.

1 mL of water has a mass of 1 g.

So, 16,000 mL has a mass of 16,000 g.



**Step 4:** Change g to kg.

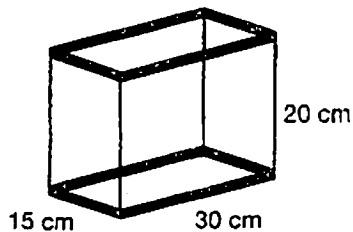
$1 \text{ kg} = 1,000 \text{ g}$ .

So,  $16,000 \text{ g} = 16,000 \div 1,000 = 16 \text{ kg}$ .

The mass of the water the aquarium will hold is 16 kg.

### Guided Practice

Find the mass, in kilograms, of the water the aquarium can hold.



1. a. Find the volume. \_\_\_\_\_
- b. Change  $\text{cm}^3$  to mL. \_\_\_\_\_
- c. Change mL to g. \_\_\_\_\_
- d. Change g to kg. \_\_\_\_\_

Complete each sentence.

2. A  $1,000 \text{ cm}^3$  container holds \_\_\_\_\_ mL of water, which is \_\_\_\_\_ L.
3. 1 L of water has a mass of \_\_\_\_\_ g, which is \_\_\_\_\_ kg.
4. A  $3,000 \text{ cm}^3$  container holds \_\_\_\_\_ mL of water, which is \_\_\_\_\_ L.
5. 2,000 mL of water fills a \_\_\_\_\_  $\text{cm}^3$  container.
6. 25 L of water has a mass of \_\_\_\_\_ g, which is \_\_\_\_\_ kg.
7. 2 kg of water has a volume of \_\_\_\_\_ L.

**SKILL 19: Practice**

Complete the table.

	Volume (cm <sup>3</sup> )	Amount of water (L)	Amount of water (mL)	Mass of water (kg)	Mass of water (g)
1. Aquarium A			25,000		
2. Aquarium B	1,800				
3. Aquarium C		120			
4. Aquarium D				44.6	

Complete each sentence.

5. 1,800 mL of water would fill a(n) \_\_\_\_\_ cm<sup>3</sup> container.
6. 2.9 kg of water would fill a(n) \_\_\_\_\_ mL container.
7. 1.25 L of water has a mass of \_\_\_\_\_ kg.
8. A 50 cm<sup>3</sup> container can hold \_\_\_\_\_ L.

Solve.

9. A bucket and the water in it have a combined mass of 5 kg. If you put enough additional water in the bucket to increase the combined mass to 5.3 kg, how many liters of water have you added? \_\_\_\_\_
10. A drinking glass contains 210 grams of water. How many cubic centimeters of water are in the glass? \_\_\_\_\_



11. Mark is going to carry a bottle of water on a camping trip. If he fills the bottle with 0.75 L of water, how much mass does the water itself add to the mass of his backpack?  
*Skill 19*  
 A 75 g                      C 75 kg  
 B 750 g                    D 750 kg

12. How much wood do you paint if you paint the outside of a closed, rectangular wooden box that is 40 cm by 30 cm by 25 cm?  
*Skill 18*  
 F 95 cm<sup>3</sup>                  H 5,900 cm<sup>2</sup>  
 G 2,950 cm<sup>2</sup>              J 30,000 cm<sup>3</sup>