CHAPTER 7   Calculating Density
Practice Problems   **BLM 3-10**

Goal • Use these questions to check your understanding of how to calculate density.

What to Do

1. A student measures the mass of an 8 cm^3 block of brown sugar to be 12.9 g. What is the density of the brown sugar?

$$M = 12.9 \text{ g}$$
$$V = 8 \text{ cm}^3$$
$$D = 1.61 \text{ g/cm}^3$$

2. A chef fills a 50 mL container with 43.5 g of cooking oil. What is the density of the oil?

$$M = 43.5 \text{ g}$$
$$V = 50 \text{ mL}$$
$$D = M/V = \frac{43.5}{50} = 0.87 \text{ g/cm}^3$$

3. A machine shop worker records the mass of an aluminum cube as 176 g. If one side of the cube measures 4 cm, what is the density of the aluminum?

$$M = 176 \text{ g}$$
$$V = L \times W \times H = 4 \times 4 \times 4 \text{ cm} = 64 \text{ cm}^3$$
$$D = \frac{M}{V} = \frac{176 \text{ g}}{64 \text{ cm}^3} = 2.75 \text{ g/cm}^3$$

4. Based on the density values on page 262 of BC Science 8, list how the following liquids would layer in a beaker from top to bottom: glycerol, ethyl alcohol, mercury, seawater, machine oil, water.

5. A teacher performing a demonstration finds that a piece of cork displaces 23.5 mL of water. The piece of cork has a mass of 5.7 g. What is the density of the cork?

$$M = 5.7 \text{ g}$$
$$V = 23.5 \text{ mL}$$
$$D = \frac{M}{V} = \frac{5.7 \text{ g}}{23.5 \text{ mL}} = 0.24 \text{ g/mL}$$

6. A carver begins work on a block of granite that measures 20 cm by 10 cm by 5 cm. If the block of granite has a mass of 2700 g, what is the density of the granite?

$$M = 2700 \text{ g}$$
$$V = 20 \times 10 \times 5 \text{ cm} = 1000 \text{ cm}^3$$
$$D = \frac{M}{V} = \frac{2700 \text{ g}}{1000 \text{ cm}^3} = 2.700 \text{ g/cm}^3$$

7. A piece of PVC plumbing pipe displaces 60 mL when placed into a container of water. If the pipe has a mass of 78 g, what is the density of PVC?

$M = 78g$

$V = 60ml$

$D = \dfrac{M}{V} = \dfrac{78}{60} = 1.3 \, g/ml$.

8. A solid magnesium flare has a mass of 1300 g and a volume of 743 cm³. What is the density of the magnesium?

$M = 1300g$

$V = 743 \, cm^3$

$D = \dfrac{M}{V} = \dfrac{1300g}{743 \, cm^3} = 1.75 \, g/cm^3$

9. An ice cube has a volume of 12 cm³, and a mass of 11 g. What is the density of the ice?

$M = 11g$

$V = 12 cm^3$

$D = \dfrac{M}{V} = \dfrac{11}{12} = 0.917 g/cm^3$

10. Gold is one of the densest substances on Earth. A gold bar 20 cm by 5 cm by 5 cm has a mass of 9.7 kg. What is the density of gold? Express your answer in g/cm³.

$M = 9.7 Kg \Rightarrow$ convert to g

$V = 20cm \times 5cm \times 5cm = 500 cm^3$

$D = \dfrac{9.7 Kg}{} \quad \dfrac{9700g}{500 cm^3} = \dfrac{19.4 g}{cm^3}$