

CHAPTER 3	Density and Pressure Review Answer Key	BLM 3.0.1A
ANSWER KEY		

1. (a) The density of air is lower than the density of water.  
(b) The density of the solid oil is greater than the liquid oil.  
(c) Rivers and lakes would freeze from the bottom to the top in winter, becoming solid blocks of ice. This would kill most organisms in the winter.

$$2. \quad D = \frac{m}{V}$$

$$D \cdot V = \frac{m}{V} \cdot V$$

$$m = DV$$

$$m = \left( 0.785 \frac{\text{g}}{\text{mL}} \right) (1.50 \times 10^3 \text{ mL})$$

$$m = 1.18 \times 10^3 \text{ g or } 1.18 \text{ kg}$$

$$3. \quad D = \frac{m}{V}$$

$$D = \frac{700 \text{ g}}{3.1 \times 10^3 \text{ L}}$$

$$D = 0.23 \frac{\text{g}}{\text{L}}$$

$$4. \quad D = \frac{m}{V}$$

$$D \cdot V = \frac{m}{V} \cdot V$$

$$\frac{DV}{D} = \frac{m}{D}$$

$$V = \frac{m}{D}$$

$$V = \frac{4.2 \times 10^3 \cancel{\text{g}}}{13.6 \frac{\cancel{\text{g}}}{\text{mL}}}$$

$$V = 3.1 \times 10^2 \text{ mL}$$

CHAPTER 3	Density and Pressure Review Answer Key (continued)	BLM 3.0.1A
ANSWER KEY		

5. (a) Since  $1 \text{ Pa} = 1 \frac{\text{N}}{\text{m}^2}$ ,  $102.5 \text{ kPa} = 1.025 \times 10^5 \frac{\text{N}}{\text{m}^2}$ .

$$P = \frac{F}{A}$$

$$P \cdot A = \frac{F}{\cancel{A}} \cdot \cancel{A}$$

$$F = PA$$

$$F = \left( 1.025 \times 10^5 \frac{\text{N}}{\text{m}^2} \right) (2.14 \times 10^4 \text{ m}^2)$$

$$F = 2.19 \times 10^9 \text{ N}$$

(b)  $1 \text{ kg} = 9.81 \text{ N}$

$$m = (2.19 \times 10^9 \text{ N}) \left( \frac{\text{kg}}{9.81 \text{ N}} \right)$$

$$m = 2.23 \times 10^8 \text{ kg}$$

6. (a)  $P = \frac{F}{A}$

$$P = \frac{820 \text{ N}}{0.045 \text{ m}^2}$$

$$P = 1.8 \times 10^4 \frac{\text{N}}{\text{m}^2} \text{ or } 1.8 \times 10^4 \text{ Pa}$$

(b)  $P = \frac{F}{A}$

$$P \cdot A = \frac{F}{\cancel{A}} \cdot \cancel{A}$$

$$F = PA$$

$$F = \left( 1.8 \times 10^4 \frac{\text{N}}{\text{m}^2} \right) (0.035 \text{ m}^2)$$

$$F = 6.3 \times 10^2 \text{ N}$$