

CHAPTER 3	Density and Pressure Problems	BLM 3.0.1
ASSESSMENT		

- (a) The density of liquid water at 4°C is 1.00 g/mL. An ice cube placed in this water floats. What does this tell you about the density of ice relative to water?

(b) In a similar experiment, a cube of solid canola oil sinks in liquid canola. How do the densities of the two phases of canola oil compare?

(c) Consider your answers to (a) and (c) above. What would be the implications to life if water had the same properties as oil?
2. What is the mass of 1.50 L of isopropanol (density = 0.785 g/mL)?
3. What is the density of an unknown gas if 3.1×10^3 L has a mass of 700 g?

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4. What volume of mercury (density = 13.6 g/mL) has a mass of 4.2 kg?
5. A weather report indicates that the atmospheric pressure is 102.5 kPa.
- (a) What force is exerted by the atmosphere on a warehouse roof with an area of $2.14 \times 10^4 \text{ m}^2$?
- (b) What mass of air does this represent (recall that 1 kg weighs 9.81 N)?
6. (a) A person weighing 820 N stands on one foot with a surface area of 0.045 m^2 . What pressure is exerted?
- (b) What is the weight of a person having a foot surface area of 0.035 m^2 and exerting the same pressure calculated in (a)?