

**FD 8.2 Question Set #2:**

1. Swimming buoys are placed in many Saskatchewan lakes to identify where it is safe to swim. What characteristics would these buoys need to have to be effective? Explain why you have chosen each characteristic.
2. Would you float better in salt water or fresh water? Explain your answer.
3. Explain why you and some other things float in water. Include examples that you have experienced or observed to support your answer.
4. The liquids below were poured into a single tube.

| Fluid           | Mass (g) | Volume (mL) |
|-----------------|----------|-------------|
| Antifreeze      | 252      | 200         |
| Water           | 100      | 100         |
| Rubbing Alcohol | 40       | 50          |

- a) What calculations do you need to make to help predict where the liquids would settle (top, middle, and bottom)?
  - b) Draw what the tube would look like after the liquids settled. How do you know this?
5. If a block of ice with a density of 0.917 g/mL were dropped into the tube, where would it end up?
  6. A 100-g mass is placed on a spring scale and the force of gravity, or weight, on the mass is measured as 1 N. The mass is then lowered into a liquid and found to weigh 0.6 N. What is the buoyant force?
  7. The same mass is lowered into a second liquid. What is the weight on the mass of this liquid to produce a buoyant force of 0.6 N?
  8. Sketch two force diagrams showing the movement in water of a solid block of steel and a beach ball.
  9. Why do some objects (such as a boat) float even though they are made of materials that are denser than water?
  10. A rectangular block measures 3 cm x 4 cm x 3 cm. How much water would it displace?
  11. Why does an object appear to weigh less in a liquid than in air?
  12. What is the buoyant force acting on a 20-N steel ball if it weighs 15 N in water?
  13. Why do some objects remain suspended in the one position in water while others sink?
  14. What is neutral buoyancy? Sketch an example showing the forces acting on the object.