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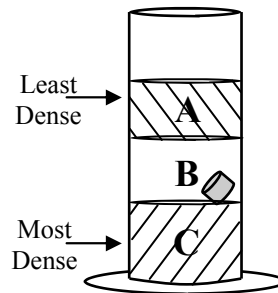
Day 15— Density, Viscosity, Buoyancy

Density

Density is how compact an object is.

If two objects have the same size, the heavier one is denser. Density is a physical property of a substance. (If you divide an object, both sides will have the same density.) The density of water is 1 g/mL.

Floating—Less dense thing (and liquids) float on more dense liquids. The diagram shows a density column.



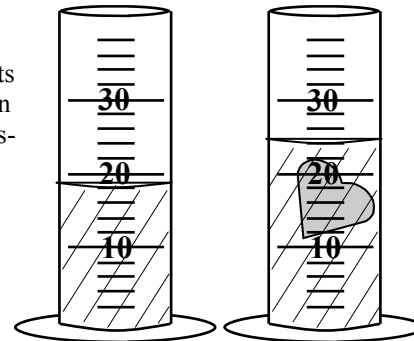
Density

in g/mL or g/cm³ → $D = \frac{m}{v}$

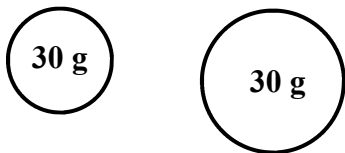
Mass in grams (g)
Volume in cm³ or mL

Density = Mass ÷ Volume

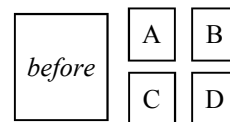
Displacement Method: Irregularly shaped objects (not easily measured) can be put in water to measure its volume.



1. Which is denser: a golf ball or a ping pong ball?
2. A. Is a penny heavy or light? B. Will a penny sink or float in water?
C. Why?
3. A. What is the volume of the heart-shaped object in the graduated cylinder?
B. If the object is 8 gram, calculate its density.
4. A. Which of the 30 gram objects below is more dense?
B. Why?

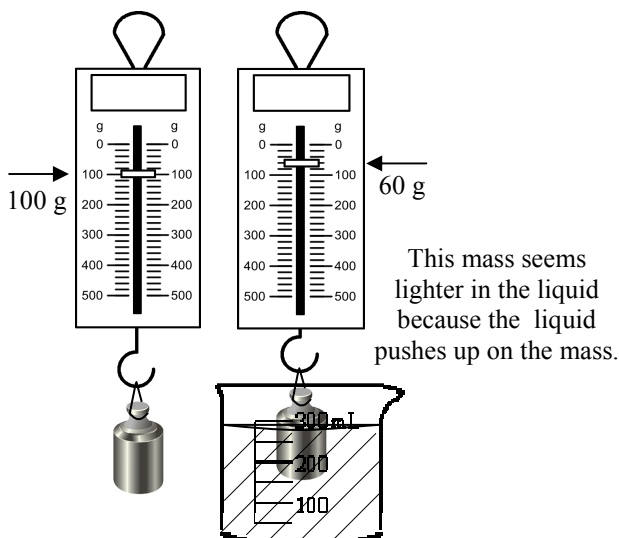


5. A block with a density of 1.60 g/cm³ is cut into three pieces. What is the density of piece B?



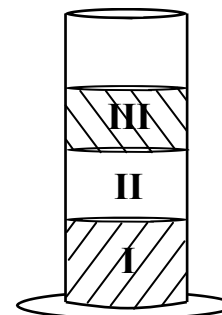
Buoyancy

Buoyancy is the upward force of a liquid on what floats on it.



6. Use the density column at the right to answer the following questions. Draw where ice will float in the column.

- A. Which liquid is the most dense?
- B. Which liquid is the least dense?
- C. Which liquid is which? A, B, or C?
D = 1.35 g/mL = Liquid ____
D = 0.86 g/mL = Liquid ____
D = 1.00 g/mL = Liquid ____

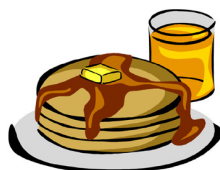


- D. Label the liquid you know.
- E. Draw where would ice float.

7. What is the buoyant force on the mass in the diagram at the left?
8. Why is it easier lift a person when you are in a pool?

Viscosity

Viscosity is how slowly a liquid flows. Syrup has high viscosity. Water has low viscosity. Denser liquids tend to have greater viscosity. A liquid's viscosity decreases as it is heated (hot liquids flow easier).



9. Which is more viscous: water or honey?
10. Which would give more buoyant force: syrup or water?
11. How can a liquid be made less viscous?