

Buoyancy Summary

$$F_B = \rho V g$$

- ρ is the density of the displaced fluid
- V is the volume of displaced fluid
- g is the acceleration of gravity
- That is, F_B is equal to the weight of the displaced fluid.

Float or Sink

- Objects can float when they have a density less than the fluid in which they are floating.
- Objects will sink in a fluid that is less dense than they are.
- Materials that are more dense than water can float (concrete canoes, steel ships, etc.) if they are shaped so that they can displace water without being fully submerged. (In other words, they form a hollow shape. Think about what a boat looks like. It has a steel shell, but is basically hollow.)

Displaced fluid

- An object floating at the surface of a fluid will displace enough fluid so that the buoyant force is equal to the weight of the object.
- A submerged object displaces an amount of fluid equal to the volume of the object.