

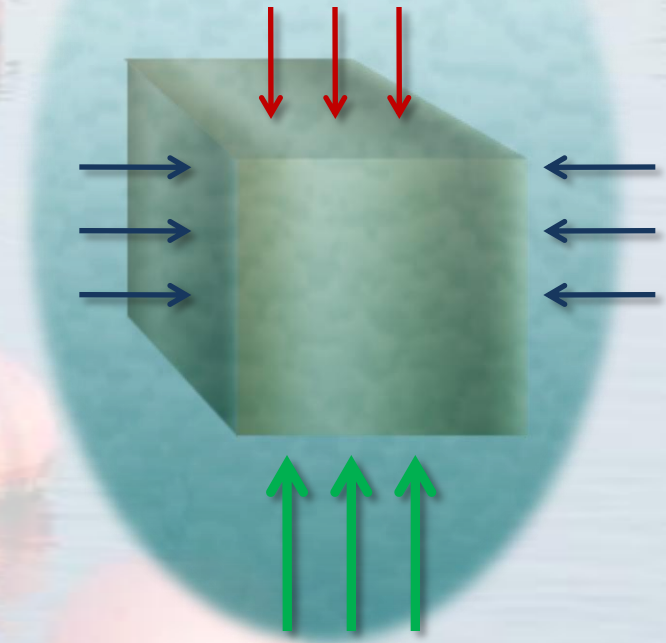


# THE BUOYANT FORCE

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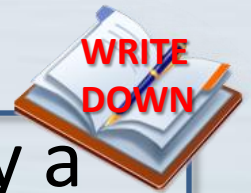
# GOING UP!

- Pressure in a fluid is exerted in all directions at right angles to the surface it is exerted on.
- The bottom of an object is deeper in the fluid than the top.
- The pressure on the bottom of the object is greater than the pressure on the top of the object.
- This results in a net upward force.



# DEFINING THE BUOYANT FORCE

- The difference between the pressure on the bottom of an object and the pressure on the top of an object in a fluid results in a net upward force.
- This net upward force is called the buoyant force.
- **Buoyant force** = upward force exerted by a fluid on any object in the fluid.



# SINKING AND FLOATING

- Gravity pulls downward while the buoyant force pushes upward.
- If the buoyant force is greater than the weight of the object, the object floats.
- If the weight of the object is greater than the buoyant force, the object sinks.
- This is true even in air.
  - Think of a helium balloon!

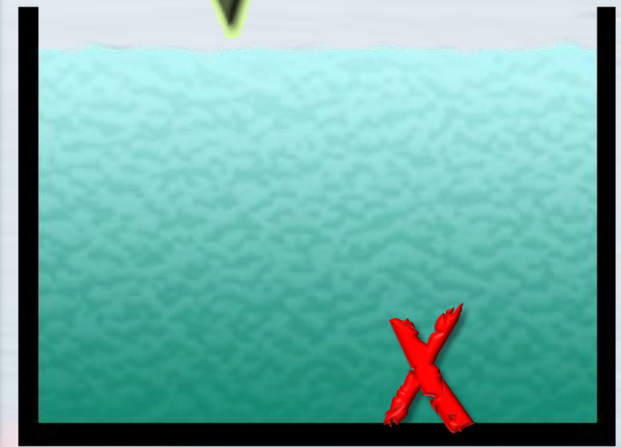


# SHAPE AND THE BUOYANT FORCE

- Which of the following pieces of aluminum foil of identical mass is more likely to float,
  - a boat, or
  - a crumpled ball?



- The buoyant force is exerted on the lower surface of the object.
- The larger the surface area is, the greater the buoyant force is.
- Objects with larger surface areas are more likely to float.



# DEPTH AND THE BUOYANT FORCE

- The buoyant force is the difference between the downward pressure on the top of an object in a fluid and the upward pressure on the bottom of an object in a fluid.
- As depth increases, both of these pressures increase by the same amount .
  - This is because the distance between the top and the bottom of the object is the same.
- As a result, the buoyant force remains the same.
- The buoyant force is not affected by depth.

