

What 2 factors determine whether an object will float or sink in water?



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- > mass
- > volume

- As the mass increases, the object is more likely to...

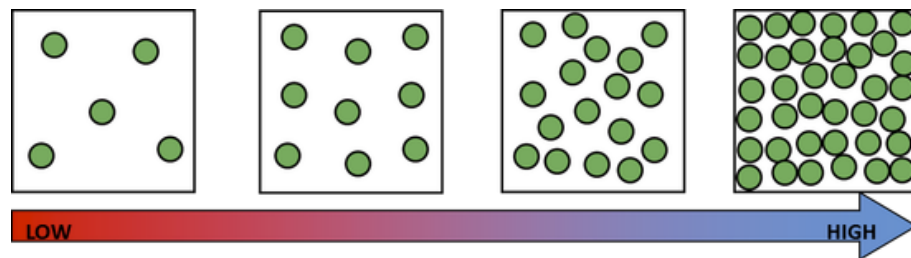
sink

- As the volume increases, the object is more likely to...

float

Density

- Density is the mass to volume ratio of an object.
 - > It tells you how compact the mass is.
 - > $\text{Density} = \text{mass}/\text{volume}$



Float or Sink?

The density of water is 1 g/ml or 1 kg/L or 1000 kg/m³

- If an object has a density less than that of water, it will float.
- If an object has a density more than that of water, it will sink.

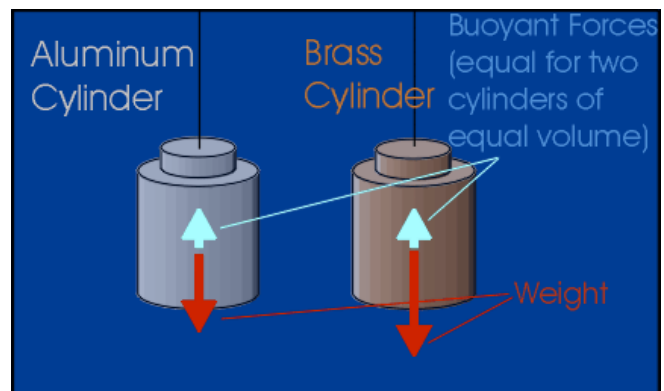
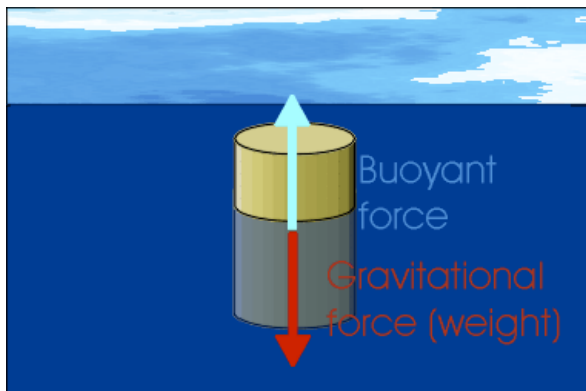


But WHY?...

Archimede's Principle

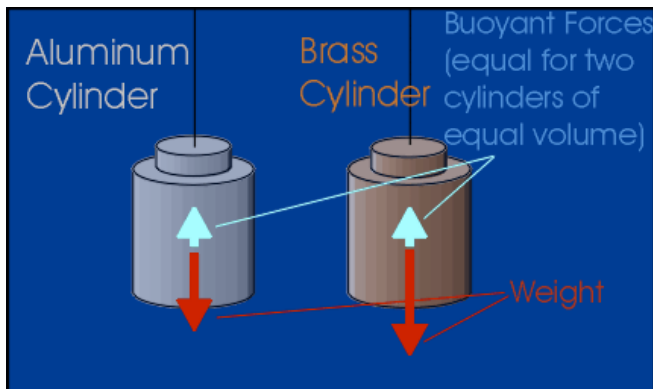
- When something is in water, there are 2 forces acting on it:
 1. Gravity (pulls object downward)
 2. Buoyant force (pushes object upward)
 - The buoyant force is equal to the weight of the volume of water displaced by the object.

What does that mean? Essentially: the more water the object can move out of the way (displace), the greater the upward force (buoyancy).

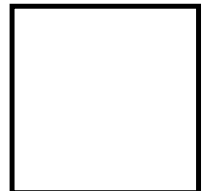
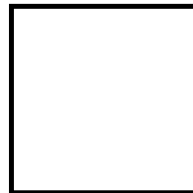


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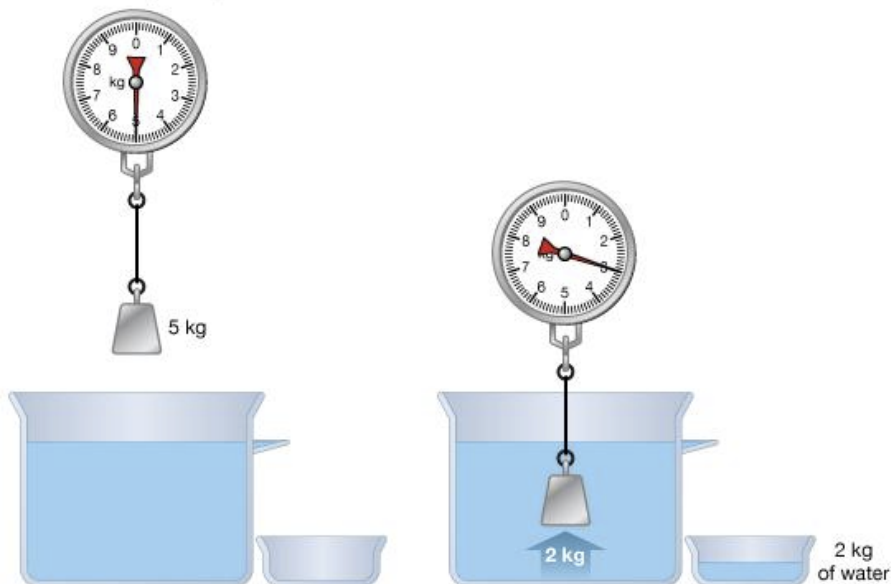
So...if an object is **MORE DENSE** than water, can it displace enough water to equal its own mass?



When you go swimming, do you feel lighter, the same, or heavier in the water than on land?

ARCHIMEDES' PRINCIPLE

Archimedes' principle



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Finish the PHET Exploration

So...why is the golfball suspended in the water?

Hint There are two different things in the graduated cylinder

Observations:

- The golf ball sinks in regular tap water.
- The golf ball floats in a concentrated salt solution.

Therefore...What do we know about the golf ball?

What can we find out about the golf ball?