

Density and Buoyancy Lab

How do ships float?

- 1) _____ is anything that has mass and takes up space.
- 2) _____ is the amount of matter in an object.
- 3) _____ is the amount of space an object takes up.
- 4) _____ is a force on an object that makes it float.

Archimedes' Principle

Any object immersed in a fluid is acted upon by an upward, or buoyant, force equal to the mass of the fluid displaced by the object.

When an object floats, it displaces a volume of water whose mass is equal to the object's own mass.

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

Let's compare density:

- 5) Mass of foil-wrapped quarters: _____
- 6) The foil-wrapped coins sank because they were more less dense than water.
- 7) Mass of foil boat with 10 quarters: _____
- 8) The foil boat floated because it was more less dense than water.
- 9) Do both objects have the same mass? yes no
- 10) Do both objects have the same volume? yes no
- 11) Mass of water displaced by the foil boat and coins: _____
- 12) Is the mass of the foil boat and 10 quarters close to the mass of the water displaced? Yes No

Flinker Challenge

When an object doesn't sink or float, it has neutral buoyancy and can "flink". Your goal is to make a cork object that can flink for 10 seconds.

For the flinker to flink, it must be

more dense than water

less dense than water

same density as water