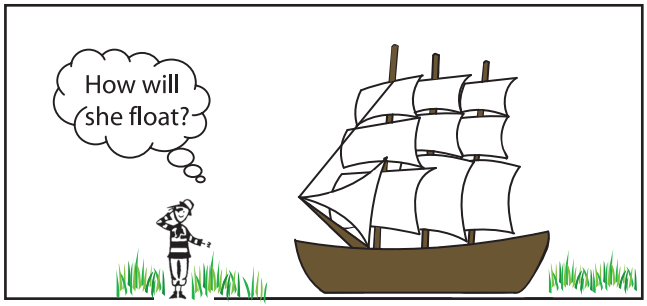
What Floats Your



USS *Constitution* is 204 feet long and 220 feet tall. During the War of 1812 she carried between 450 and 500 men, over 50 guns (the majority weighing 7,000 pounds each - that's more than a truck weighs!) and a massive amount of cargo. How was *Constitution* able to stay afloat? The answer: **Archimedes**, **density**, and **displacement**.

Archimedes was an ancient Greek mathematician and inventor who discovered what is now known as "Archimedes Principle." This principle says that when an object is placed in a fluid, it is buoyed (lifted or pushed) upwards by a force equal to the weight of the fluid. There is a downward push of the object and an upward push of the fluid. When the object enters the water, it pushes (or displaces) water out of the way to make room for the ship! This is called **displacement**.

The weight of *Constitution* pushes down on the water

The water that is displaced pushes up on *Constitution* and allows her to float.

But how do we know if the weight of an object is more than the weight of the water it displaces? That's where **density** comes in. Density measures how much weight there is within a certain amount of space. A box packed full of sand is more dense than a box loosely filled with feathers. If an object is less dense than water, it will float.

Try out Archimedes' ideas!

Materials

A large plastic container, sink, or bathtub filled with water (this will be your Experiment Station)

Several small objects from around your home (for example, a coin, paper clip, apple, ping pong ball, cork, etc.)

Play dough (for the follow-up activity)

Directions

Using the provided chart, make a list of your objects.

In the column next to each object, predict whether that object will float or sink and why.

Test your predictions by placing the objects in water.

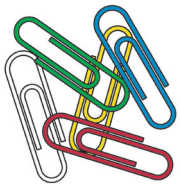
Record your results in the third column of the chart.

Why did some objects float and others sink? Share your ideas and what you have learned with a classmate.

Follow-Up Activity

Divide a ball of play dough into two pieces that are equal in size.

Using your Experiment Station, try to make one piece of play dough float and the other sink (hint: play around with the *shape* of the play dough).



Go back to the household objects that you used before: try to make the sinkable (more dense) objects float, and the floating (less dense) objects sink.

Record your results in the table below.

Object	Were you able to make it sink/float?	Why or why not?

Based on your results and play dough activity, how do you think shape affects whether an object will float or sink?

_____

_____

_____

_____

Experiment Log

Name of Object	Will it float? Why or why not?	What happened?