

BOATS

**Why they float and how to
make your own!**



WHY DO BOATS FLOAT?

Science can explain how boats float!

Science is the study of the structure and behavior of the world through observation and experiment. Anyone can be a scientist!

People have been scientists for thousands of years.

Archimedes, a Greek scientist who lived many centuries ago, studied what happened when objects were placed in water. He discovered that an object would move water out of the way to make room for itself. This is called **displacement**.

You have probably experienced **displacement** at home.

Have you gotten in a tub filled with water and watched the water level rise? This is **displacement**! The water moved out of the way for you.

When an object, like a boat or a person, enters water there are two forces that act upon it.

One force is a downward force (**gravity**) and the other is an upward force (**buoyancy**). **Gravity** is determined by the weight of the object. **Buoyancy** is determined by the weight of the water **displaced** by the object.

But how do these two forces relate to why a boat will float?

Any object will float if the gravitational force is less than the buoyancy force.

Think about a pebble and a toy boat. The pebble might weigh less than the toy boat, but the toy boat will float because the boat displaces more water than the pebble.



PADDLE BOAT



Supplies

- cardboard
- duct tape
- rubber band

You also need:

- scissors
- writing utensil

1. Draw the boat shape on the cardboard. It looks like a house with a door in the middle.
2. Cut the boat shape out. Save the "door" to be your paddle. Cut the paddle a little smaller on each side.
3. Cover the entire boat and paddle with duct tape. Make sure to cover the sides, too! This helps keep your boat from getting soggy.
4. Put a rubber band around the boat shape.
5. Slide the paddle piece between the rubber band. Make sure there's enough room for the paddle to flip.
6. Twist the rubber band and paddle away from the front of the boat. Wind it a few times.
7. Your boat is ready for the water. Place it in a partially filled tub or container and see what happens!

PAPER BOAT

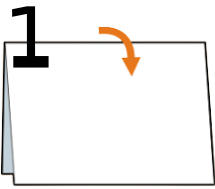


Supplies

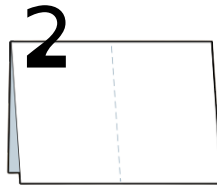
- 8.5" x 11" paper

Optional:

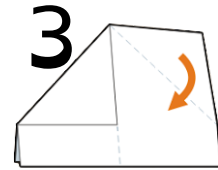
- tape
- crayons, markers, colored pencils



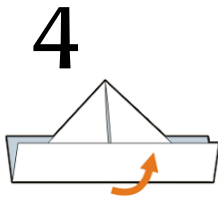
1
Fold paper in half from top to bottom.



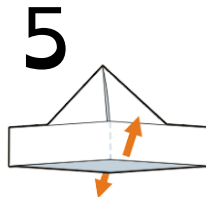
2
To find the center, fold the paper in half the other way. Unfold.



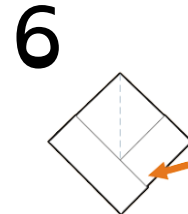
3
Fold the corners down, using the center line as a guide.



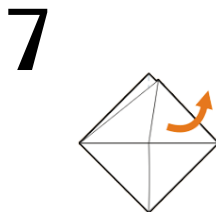
4
Fold the flaps up on both sides.



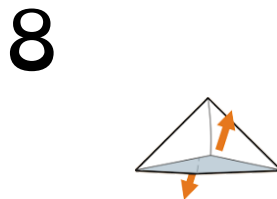
5
Place thumbs inside and pull out until it becomes a square.



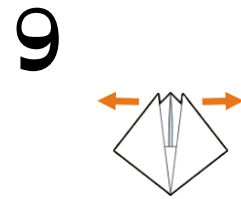
6
Tuck corners of one flap into the other. Repeat on the other side.



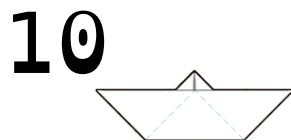
7
Fold the flaps up on both sides.



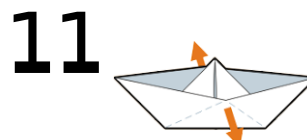
8
Place thumbs inside and pull out until it makes a square.



9
Pull the corners out.



10
Press flat.



11
Open out to make a boat shape.