



## STEM @ HOME GUIDE

### Balloon Powered Boat

- **Aim:** To create a boat that is powered by air.

- **Materials required:**

- ✓ Sponge
- ✓ Balloon
- ✓ Straw
- ✓ Rubber Band
- ✓ Ruler
- ✓ Knife or Scissors
- ✓ Sink, bathtub or kiddie pool for your boat

#### HELPFUL TIPS

Cut your straw in half and bend it to make a 'rudder'

Blow the balloon up once or twice to make it easier once its connected to the sponge.

- **Questions to think about before you start:**

- ✓ Why do some materials float and others sink?
- ✓ Can you get a boat to move using just an air-filled balloon?

- **Instructions:**

Make sure to perform the experiment as a team (parent and student). Please read the instructions out loud.

- **Student:** Using a ruler find the middle of the sponge and make a small mark at one of the narrow ends of the sponge. Then, draw a diagonal line from the middle mark to the longer corner of the sponge and repeat on the other side.
- **Parent:** Using a knife or scissors cut along the lines removing two triangle shaped sections from the sponge
- **Student:** Using your ruler find the exact middle of the sponge and mark it with an "X".
- **Parent:** Cut a small slit in the middle of the sponge, where the "X" is, this is where your straw and balloon will go
- **Student:** Insert the balloon through the top of the sponge and insert the straw through the bottom of the sponge into the bottom of the balloon.
- **Parent:** Tie the rubber band around the bottom of the balloon and straw to make sure they are well connected.
- **Student:** Blow up your balloon through the straw and hold it closed until your boat is in the water. Now let go and watch your boat go!

- **The science behind the fun:**

Materials that have air in them or tiny holes like a sponge can float on top of the water easier than materials that don't have air. This concept is called buoyancy, if you have ever worn pool floaties or a life jacket you have experienced how air can help things float. The boat is moved through the water by the force of the air coming out of the balloon and straw. As the air moves out of the straw it pushes the boat in the opposite direction.

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- **Real world application:**

Knowing what materials are more buoyant allows engineers to design boats of all shapes and sizes that will not sink. Marine engineers design ships with air compartments to allow them to stay afloat even when they are carrying very heavy things. Boat motors have propellers that move air and water very quickly pushing the boat in the opposite direction of the air and water movement.

- **Extensions Activities:**

- ✓ Try blowing up the balloon to different sizes and see how that impacts the speed it moves through the water.
- ✓ Find a wider or more narrow straw or tube to attach and observe if it changes the speed of the boat.
- ✓ Find some other materials you can use instead of a sponge to make a balloon powered boat.

**Did you know?**

- Household sponges are modeled after Sea sponges. They both have pores and channels to allow water to move through them.
- Sea sponges were used originally for cleaning and bathing purposes and were used as far back as Ancient Greece!

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Materials



Step 1



Step 2



Step 3 + 4



Step 5



Step 6



Step 7

