







## ACTIVITY 1 | SAILING BOAT



### STEM Learning Objectives:

-  **Science:**  
Explore resistance in water by making and testing a boat.
-  **Technology:**  
Use a range of tools, equipment, materials and components.
-  **Engineering:**  
Understand the forces acting on a sailing boat.
-  **Maths:**  
Measuring and marking out.

### WHAT YOU NEED:

- Materials:**
- Polystyrene foam pizza disc
  - A4 coloured card
  - Plastic milk bottle lid
  - Wooden skewer
  - Decorations



- Tools:**
- Low melt glue gun
  - Ruler
  - Felt tip pens
  - Large scissors
  - Lump of poster tack
  - Pencil
  - Hole punch
  - Water tray



Can you spot any hazards? How can you reduce the risks?

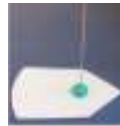
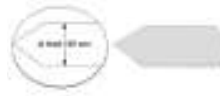
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### WHAT YOU DO:

1. Use the felt tip and ruler to draw a boat shape on your pizza disc. Make it as long as the disc and quite wide to help prevent the boat capsizing. Cut out the boat base.
2. Place the poster tack on the table and press a bottle lid onto it with the open side downwards. Press down with the pencil to make a small hole in the middle. Don't make the hole too big as it needs to be a tight fit on the skewer.
3. Take out the poster tack and glue the lid down towards the front of the boat base. Push the pointed end of the skewer down through the hole in the lid and into the base.
4. Cut the sheet of coloured card so that it is shorter than the skewer, and trim it to your preferred shape. You can decorate it with a felt tip pen. Punch a hole in the middle of the top and bottom, then slide the sail onto the skewer.
5. Place the boat in the water tray and blow into the sail to make it move across the water. You can customise your boat by adding a sailor, flag, decorations etc. You could try to help it move faster, for example by changing the shape of the base to make it more streamlined.



### STEM Explanation:

Gravity acts downwards on the boat, pulling it down onto the water.

The boat base is made from polystyrene foam pizza disc; this contains lots of little air pockets, making it buoyant so that it doesn't sink.

When you blow into the sail the boat moves across the water.

The resistance of the water (drag) slows the boat down.

If you make the boat more streamlined (e.g. by making the front pointed and rounding off the corners) this reduces the drag so the boat can go faster.



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**Draw and annotate your sailing boat here:**

**Explain two improvements you could make to your boat:**