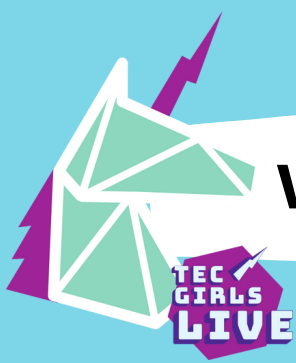


Brilliant Boats

Can you make a boat that not only floats but moves? Here are three different boat designs for you to try using recycled materials.

EXTRA CHALLENGE:

Can you transport cargo with your design?



Water-powered boat

What you'll need:

- Two cups
- A tube
- A container
- Tape
- A lolly stick



1 Cut a hole the size of the end of the tube about 1 third of the way up your cup.

3 Cut a tube sized hole at the end of your container.

2 Attach the cup to a container. We used two plastic trays. We cut a hole in one for the cup to sit in, then placed this tray inside the other.

4 Feed the tube through this hole and into the cup so that one end is in the cup but most of the tube extends out behind the boat.

5 You want your tube to lie flat. We supported it by taping it to a lolly stick on the bottom of the boat.

6 Fill another cup or bottle with water. Hold a finger over the end of the tube and place your boat in the water.

7 Slowly pour water into the cup. Release your finger and watch your boat begin to move.

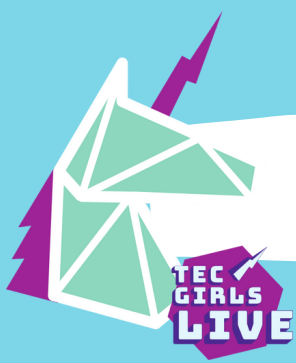


Why does it move?

As the water flows out of the tube, it has something called backwards momentum. There always has to be forward momentum to cancel it out. This means that the boat gains forward momentum, causing it to move forwards through the water.

How many sweets can you add to your boat without it sinking? How does it affect the speed of your boat?

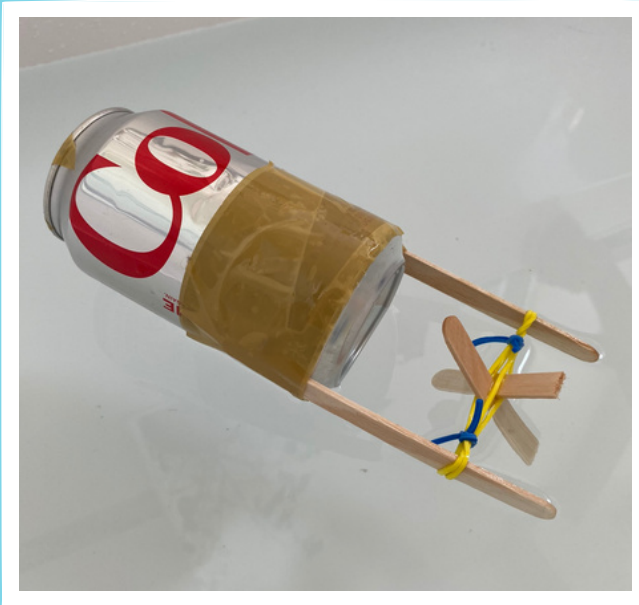




Propeller boat

What you'll need:

- A container - e.g., can or carton
- Two lolly sticks
- Two elastic bands
- A propeller
- Tape



1 Tape two lollipop sticks to a can or container as shown.

2 If using a can, make sure to seal the hole in the top with tape!

3 Slide two elastic bands onto the lolly sticks.

4 Insert a propeller between the bands.

5 Spin it backwards, twisting the bands.

6 Put the boat in the water and release the propeller.

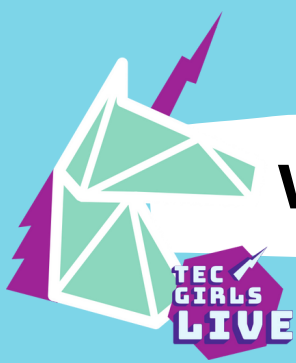
Why does it move?

As you twist the rubber bands, they stretch and store energy. When you release the bands, they transfer this energy to the lollipop sticks, causing them to spin. They push against the water as they spin and push the boat forward.

★ Explore how the height and angle of the lolly sticks affects the boat's movement.

★ Add sweets to your boat! We dropped them inside the can and resealed it. How many sweets can you add without your boat sinking? How does the placement of the sweets affect the boat's movement?

★ Experiment designing your own boat.

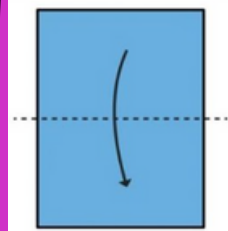


Wind-powered boat

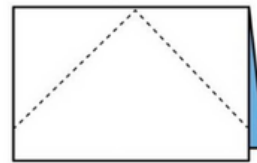


What you'll need:

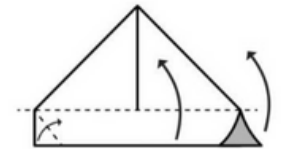
- A sheet of A4 paper
- A straw
- Some more paper for a sail
- A lolly stick/straw for a mast
- A Crayon
- Maybe tape



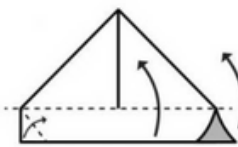
1. FOLD IN HALF



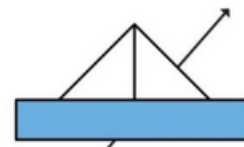
2. FOLD TRIANGLES TO THE CENTER



3. FOLD THE CORNERS ON BOTH SIDES TO THE DOTTED HEADLINE



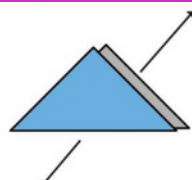
4. FOLD UP FLAPS ON BOTH SIDES



5. PULL THE SIDES OUT AND PRESS FLAT



6. FOLD FRONT AND BACK LAYERS UP



7. PULL SIDES OUT AND PRESS JUST LIKE STEPS 5



8. PULL TOP TRIANGLES



9. BE SURE THAT THE BOAT IS OPEN ALONG THE BOTTOM

10. Create a small slit in the point in the middle of the boat and add a mast and sail.

11. Use a straw to blow your boat along. See if you can keep it moving in a straight line.



Colouring the bottom of your boat with wax crayons creates a semi waterproof coating helping it float longer!



How many sweets can you add to your boat without it sinking? How does it affect the speed of your boat?

Why does it move?

The force of drag keeps the boat stationary. But as you blow through the straw, air particles hit the boat's sail. They transfer a force onto the boat which is stronger than the the drag of the water. This causes the boat to move forwards.