ENGINEERING
CHALLENGE

09

BOAT POWERED BY A CHEMICAL REACTION

THE
JAMES
DYSON
FOUNDATION

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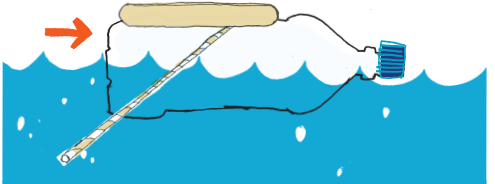
Designed by Rob, Engineering reliability manager at Dyson

The brief

Build a boat powered by a chemical reaction.

The method

1. Tape the cork and ice lolly sticks together to form a triangle.
2. Tape the triangle to the middle of one side of the bottle.
3. Make a hole in the end of the bottle, at the opposite side to the triangle, so it will sit below the water.
4. Push the drinking straw through the hole so the end inside the bottle touches the inside wall.
5. Pour in vinegar and add bicarbonate of soda. Screw the bottle top back on tightly.
6. With a thumb covering the end of the drinking straw, shake the bottle.
7. Once the reaction starts, drop the boat in the water and watch it propel forward.



How does it work?

When the vinegar and bicarbonate of soda come into contact, a chemical reaction occurs and carbon dioxide is released. This causes pressure to build, gas to be forced down the straw and the boat to be propelled across the water.

Materials

- Small plastic bottle
- Sticky tape
- A cork
- Two ice lolly sticks
- Scissors (with adult supervision)
- A drinking straw
- Vinegar
- Bicarbonate of soda
- Somewhere to sail it – such as a bath tub or sink

Design icons

Rockets use a chemical reaction during lift off. Combining fuel and oxygen causes combustion and exhaust gases are released. These gases exit the engine nozzle at high speed and push the rocket skyward.