

# Move a boat with soap

Discover how washing-up liquid can power a boat.

## What you need

- A large bowl
- Water
- Boat template
- Card
- Pen or pencil
- Scissors
- 2 toothpicks
- Washing-up liquid

## How does it work?

This experiment demonstrates the Marangoni effect, which is caused by attraction between individual molecules in a liquid. Water molecules are attracted to each other and so resist being separated. This sticky, attractive force is called surface tension, and is why light insects, such as pondskaters, can walk across the surface of water without falling in. Soap, however, decreases the attraction between water molecules. Liquids naturally flow from zones of low surface tension towards areas of higher surface tension, so when the liquid flows away from the back of the boat, the boat is pushed forward.



## MARVELLOUS MARANGONI

Italian physicist Carlo Giuseppe Matteo Marangoni first described the Marangoni effect in the 1860s.

## TOP TIP

Refill the bowl with fresh water if you do the experiment again. It won't work if there's any soap in the water.



**1** Fill a shallow dish, tray or bowl almost to the top with water.



**2** Cut out the template below and draw around it onto some card. Cut out the shape carefully with scissors. This is your boat base.



**3** Cut a small rectangle (about 6cm x 4cm) out of card for the sail. Push a toothpick through the centre at the top and bottom to make a mast.



## BOAT TEMPLATE

Cut out this template (only when you have finished the activity on page 27).



**4** Push the bottom of the mast into the base. Using another toothpick, smear some washing-up liquid on the notch at the back of the boat.



**5** Carefully, place the boat onto the surface of the water. Watch how it speeds off.