

Sink or swim?

Discover the effect of salt on buoyancy and the importance of salt levels in the sea

Suitable for Beavers, Cubs and Scouts

Anyone who's been swimming in the sea will have noticed how much easier it is to float than in a swimming pool or bath. Share the information on this page and use these two experiments to demonstrate how adding salt increases buoyancy.

Experiment one

You will need (per team)

- table salt
- pint glasses x two
- tablespoon
- tap water
- raw eggs x 2

Wogglebox



Caleb says:
'I liked doing this because I want to do more scientific experiments. It was fun watching the ice cubes melt.'

- 1 Ask your young people to discuss the types of species that live in the world's oceans. What sort of habitats do these animals and plants need?
- 2 Divide the group into small teams. Ask each team to fill two pint glasses with cold tap water two-thirds full.
- 3 Next, ask them to add six tablespoons of salt to one of the pint glasses and to stir until the salt has dissolved.
- 4 Ask the young people to gently place one egg in each of the pint glasses. What happens?

The young scientists should see that the egg in the salty water floats while the other one sinks, because salt water is denser than fresh water.

- 5 Ask the young people what they think will happen to the animals and plants you discussed at the beginning if the amount of salt in the ocean changes.
- 6 Use the eggs for a baking project or pop them back in the fridge to eat later, so that they are not wasted.

Salty seas: share this with your young people

- Different oceans have different salinity (salt levels). For example, the Mediterranean Sea is nearly four times more salty than the Baltic Sea.
- The salt in the sea comes from rocks, via erosion and by being dissolved by acidity in rain water.
- Salt is continuously being added to the sea, but this is counterbalanced by fresh water from rivers, rain, snow and melting ice.
- The movement of water in the upper part of the ocean is controlled by wind, but deep below the surface it is controlled by the density of the water, which is determined by temperature and salinity.
- The Earth's climate is maintained by heat being absorbed and transported through our oceans.
- Excess heat from the increase in global temperatures over the last 100 years is being moved around by the sea, but this is changing the levels of salt water in different areas of the world.
- As salinity increases, some aquatic species may be threatened, including plant and animal life.

Experiment two

You will need (per team)

- freezer
- ice cube tray
- tap water
- food dye
- table salt
- pint glasses x 2

1 Help the young people to make coloured ice cubes using water and a little bit of food dye. Once they're frozen, show the group what the ice

cubes look like when they look closely. See if they notice that the food dye is no longer evenly spread through the ice.

2 Ask the groups to fill their two glasses with water up to two-thirds full, and then add two tablespoons of salt to one of the glasses, stirring until it's dissolved.

3 Next, they need to put one ice cube into each glass and watch what happens. They should see that as the ice cube melts in the fresh water, the dyed

water being released from the ice cube will form a blob that falls in the glass, then rises again, before mixing with the rest of the water. In the salty water, the dyed water from the melting ice cube immediately floats to the top.

4 How it works: explain that the dyed water is heavier than the fresh water, so it falls to the bottom before dispersing and becoming lighter, which makes it float back to the top. The saltwater is denser, so the melting dyed water floats straight to the top.

Time needed 30 minutes

Badge



Rolls-Royce sponsors the Scout Scientist Activity Badge and the Cub Scientist Activity Badge

Partner



Outcomes

The young people will discover the buoyancy effects of adding salt to water, and find out why salinity in the oceans is important for marine life.

More information

For more badge resources, activity sheets and safety guidance visit: scouts.org.uk/rollsroyce.