SCIENCE
CHALLENGE

06

EXPANDING GASES

THE
JAMES
DYSON
FOUNDATION

EXPANDING GASES

SCIENCE CHALLENGE 06

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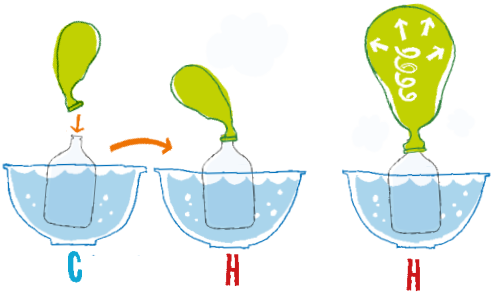
The brief

Find out what happens when gases are heated up or cooled down.

The method

1. Fill two bowls – one with cold water the other with hot water.
2. Put the bottle into cold water.
3. Fit a balloon to the neck of the bottle.
4. Now place the bottle into the hot water.
5. Watch the balloon expand.



Materials

- Two bowls
- Cold water, hot water (with adult supervision)
- A sturdy plastic bottle
- A balloon

How does it work?

Gas expands when it is heated. The rule is, if the pressure of a gas remains constant, the volume of the gas will increase as the temperature increases. So if the temperature increases, the gas takes up more space. This is known as Charles' Law. The principle was first formulated by the French physicist Jacques Alexandre Cesar Charles in 1787.

Design icons

Steam engines heat up air and allow it to expand in cylinders to drive wheels.