



## Rockets - How do rockets work?

### Fact

- Rockets take off if they have enough fuel to take them beyond the Earth's gravitational pull.
- The blast of the fuel igniting pushes the rocket up into the air in the opposite direction to the way the blast of flames is going.
- Scientist have a rule: For every action there is an equal and opposite reaction. And it's the rule that explains how rockets work. The action of the blast rushing out of the rocket in one direction has an equal reaction on the rocket that pushes it in the opposite direction.
- A scientist called Isaac Newton discovered this scientific rule hundreds of years ago. Rockets have enormous tanks for fuel and oxygen.

### Do you know

- Rockets need to carry oxygen because there's no oxygen in space and fuel needs oxygen to burn.
- Jet engines work the same way rockets work. They need oxygen to burn fuel to give them the push to fly up and through the air.
- The blast of a fire and gasses that shoot out of the back of a rocket is around 10,000 kilometres per hour.

### Experiments you can do

You can make your own balloon rocket. Blow up the balloon and hold it tightly by the opening. Let a little bit of air out so that the air blows towards you (maybe it will ruffle your hair) Then let the balloon go completely. Watch the direction the balloon heads in – it should go in the opposite direction to the way the air came out towards you. Does it move in an opposite direction?

### Other Investigations

Here's another balloon rocket experiment.

#### What you need:

The help of an adult

A chair or a stool

A piece of string about 4 metres long

A drinking straw

Sellotape

A drawing pin

A balloon

A peg

#### What you do:

Push one end of the piece of string through the straw. Tie one end of the string to the a leg of the chair, somewhere near the floor. And have the adult help you pin the other end of the string near the ceiling across the room so that the string is pulled tight.

Blow up the balloon then twist its neck and clamp it with a clothes peg so the air can't escape.

Use two pieces of tape to attach the balloon to the straw with the clothes peg and neck of the balloon pointing to the leg of the chair.

Then remove the clothes peg and let the balloon blast off.