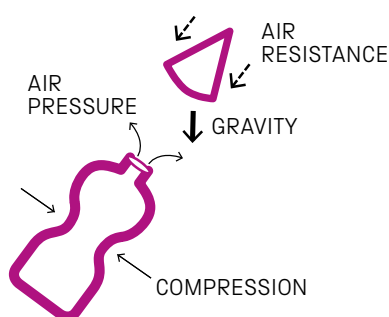


# Overview for adults

**There's an old saying: what goes up must come down. This activity is a perfect chance to challenge that idea, shooting a rocket high into the air by rapidly squashing a plastic bottle launcher. You'll never get this rocket into space – but some real rockets do go fast enough to prove the saying wrong.**

## What's the science?



The bottle used as the rocket launcher is not really empty: there is air inside it. Air is elastic (squashy), and when you compress it, it pushes back and the pressure inside increases. In the activity, the sudden increase in air pressure inside the bottle pushes hard on the bottom of the rocket, sending it flying high into the air. There are also two other forces acting on the rocket: air resistance and gravity. Air resistance always pushes in the opposite direction to the rocket's movement, and its strength depends on the rocket's shape and its speed. Gravity always pulls downwards, slowing the rocket's climb but speeding up its descent.

## Science in your world

Just as increasing the air pressure in the bottle sends the rocket flying, you use air pressure when you squeeze shampoo or ketchup from a plastic bottle. It's not usually as exciting as watching the rocket shoot into the air in the activity... unless you're having a food fight!

## Did you know...?

In order to keep going straight upwards and never fall down again, a rocket must reach a speed called escape velocity, which is 11.2 kilometres per second.

# SCIENCE MUSEUM GROUP

## You will need...



An empty plastic milk bottle (4- or 6-pint bottles work best)



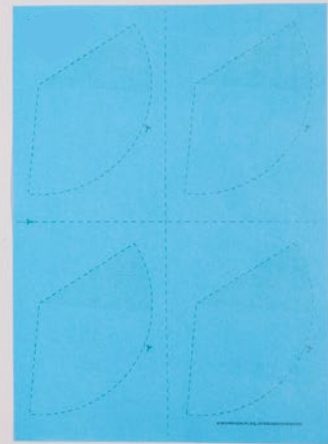
Things to decorate your rocket, eg pens, tissue paper, coloured card, feathers, glitter



Scissors



Sticky tape



A rocket template

## Think and talk about...

- What makes your rocket fly?
- What makes it come down again?
- How do you think a real rocket works?

## Investigate...

- How could you make your rocket travel higher?
- How could you make your rocket go more slowly?
- Can you make your rocket spin as it falls?

## Follow these steps...



**1** Cut out a template along the dotted lines.



**2** Roll it into a cone shape and secure it with tape – this is your rocket.



**3** Decorate your rocket any way you like...



**4** Now pop it on top of the bottle.



**5** Hit the sides and launch your rocket into the air!

## Science in your world

Just as increasing the air pressure in the bottle sends the rocket flying, you use air pressure when you squeeze shampoo or ketchup from a plastic bottle.



