

# Suzy's World

## Air - How can air inflate a balloon?

### Fact

- Although you can't see air particles air takes up space and air particles can be squashed.
- You can force quite a bit of air into a balloon because the rubber in the balloon is very stretchy.
- Air is made up of tiny gas particles and those particles are constantly moving.
- When you force air into a small space it creates pressure with all those tiny particles trying to find a way out. In the case of a stretchy balloon the air particles push on the rubber and stretch it making the balloon inflate.
- The air pressure pushes evenly inside the balloon so it inflates the balloon equally – there are no lumpy bits or hollows where the air isn't pushing.
- And the air pressure outside the balloon pushes evenly on the outside of the balloon

### Do you know

- Air is made up of gases – 78% Nitrogen, 21% Oxygen and the other 1% is made up of other gases like Carbon Dioxide, Methane, Helium etc
- Gases are a bit like water – they move and flow but their particles have bigger gaps between them and the particles are constantly on the go – spreading out.
- Your lungs get inflated by air the same way a balloon does when you breathe in air.
- Your lungs are made of very soft spongy pink matter, which stretches easily when we breathe in air.
- When we breathe out our lungs shrink just like a balloon.

### Experiments you can do

Blow up a balloon without putting it near your mouth.

#### What you need:

2 identical balloons

2,1 litre bottles of fizzy, different flavours

A tape measure

Paper and Pen

The help of an adult

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## What you do:

Stretch the balloons with your hands to make them flexible. Have an adult help you quickly put the mouth of the balloon over the bottle opening as soon as the lid is taken off. Watch the balloon – it should start to inflate. Gently shake the bottle and shake it every now and then for about 5 minutes. Measure the widest part of the balloon and leave the balloon and bottle to sit while you repeat the experiment with a different type of fizzy drink.

The fizzy drink has tiny bubbles of carbon dioxide gas in the liquid that float to the top and try to escape out of the bottle opening once it's opened. When the balloon is over the opening of the bottle, the carbon dioxide gas rushes in to inflate the balloon. Which fizzy drink had the most carbon dioxide in it?  
How long will the balloon remain inflated for just sitting on the bottle?

## **Other Investigations**

An interesting thing is that when the weather is cold the particles move closer together. When the air is warm the particles take up more room by spreading out. Measure a balloon full of air. Measure the length and the circumference and write down those measurements then put the balloon in freezer.

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Bring the balloon out of freezer and measure it again – you'll find that it's smaller. That's because the particles have stopped moving and are huddling closer together. They've contracted and aren't pushing on the balloon so much so the balloon has shrunk. As the air in the balloon warms up it will expand, move more quickly and the balloon will stretch back.

Put a pin in a balloon without popping it:

## What you need:

A balloon, blown up and tied off  
A pin  
A piece of sticky tape

## What you do:

Put the sticky tape onto the balloon then gently push the pin through the tape. It should pierce the balloon without popping it. It's a great trick to amaze your family and friends – just be very careful with the pin.