



# SCIENCE MUSEUM GROUP



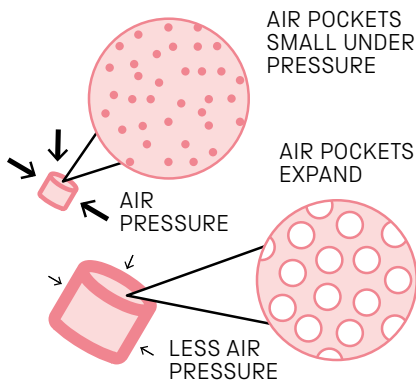
## NO PRESSURE!

<b>MAKING</b> 	Age <b>11-14</b>	Topic <b>EARTH AND SPACE</b>	 <b>20 MIN</b>
	Skills used <b>MAKING OBSERVATIONS • CURIOSITY</b>		

## Overview for adults

Ever wondered what would happen to your body in space? This activity will give you some idea. It shows how a marshmallow expands dramatically when normal atmospheric pressure is reduced – but it's hard to imagine a human body in its place!

### What's the science?



The atmosphere stretches for a few hundred kilometres above our heads. The weight of all that air pushes on every surface. Trapped inside marshmallows are thousands of tiny bubbles, and the air inside those bubbles is at atmospheric pressure – the same as the air outside. Reduce the pressure around the marshmallows, by removing air from the bottle, and the air pressure inside those pockets is now greater than the air pressure outside, so the marshmallows puff up dramatically. Allow air back into the bottle, and atmospheric pressure squashes the air pockets again, so the marshmallows shrink back to normal.

### Science in your world

Popcorn kernels expand in a similar way to the marshmallows in the activity – but in that case it's because of the pressure inside the kernels becoming much greater than atmospheric pressure, as water inside them turns to steam and expands. A vacuum cleaner makes an area of low pressure, creating suction as atmospheric pressure causes air to rush in, bringing dust and debris with it.

### Did you know...?

If your body were exposed to the near vacuum of space, your blood would quickly boil and your eyes would explode.

Create your own vacuum in a bottle  
and investigate the awesome power  
of atmospheric pressure.

## You will need...



A glass bottle



Small marshmallows



A drink vacuum pump  
and its rubber stopper

## Think and talk about...

- What do you see happening?
- What makes the marshmallows expand?
- What do you think might happen to humans in a similar environment, such as in space?

## Investigate...

- What happens if you use a plastic bottle instead of a glass one? Why do you think there's a difference?
- Try putting other items in the bottle – such as grapes, shaving cream or jelly sweets – and see what happens. Was it what you expected?

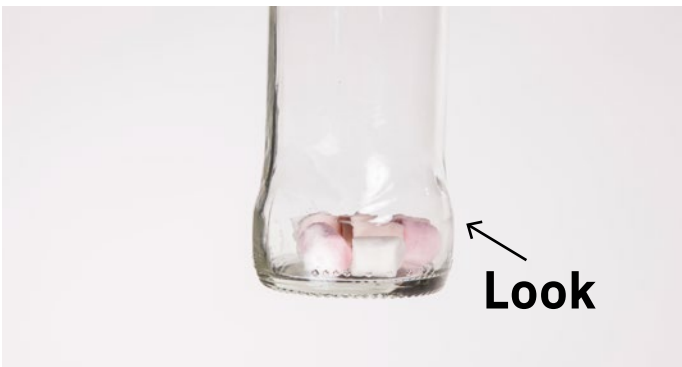
## Follow these steps...



- 1** Put four or five marshmallows into a glass bottle.



- 2** Pump it  
Push the rubber stopper into the bottle, put the pump on top and use it to remove the air until you see a change in the marshmallows.



- 3** Look at what has happened to your marshmallows.



- 4** Take the rubber stopper out of the bottle and watch your marshmallows closely.



- 5** Look at your marshmallows now!



- 6** See what happens if you try other things in the bottle.

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## Science in your world

When popcorn is heated in a pan, tiny droplets of water inside turn to steam. The steam pushes outwards more than the air pressure outside the popcorn kernels pushes inwards. This makes the kernels puff up.

