

# The Power of Pressure

In keeping with the theme of Science Week 2014, here are some activities to demonstrate the “power” of air pressure.

SCIENCE  
WEEK

9-16 NOVEMBER 2014

THE  
POWER  
OF SCIENCE

## THE “LUNG” SYRINGE

### YOU WILL NEED

Marshmallows, plastic syringe - get the largest size available.

### BASIC INSTRUCTIONS

*Feel free to experiment!*

1. Open the syringe and drop a marshmallow in so it is free to move.
2. Replace the plunger and move it in carefully until it just touches the marshmallow.
3. Place your thumb tightly over the opening.
4. Pull out the plunger of the syringe as strongly as you can, as far as you can.
5. Observe the marshmallow - can you see it grow in size, filling the syringe space?
6. Release the plunger and your thumb, and again observe the marshmallow.
7. Replace the marshmallow with a fresh one.
8. Place the plunger just inside the syringe this time.
9. Place your thumb tightly over the opening.
10. Push in the plunger as far as you can and as strongly as you can.
11. Observe the marshmallow - can you see it shrinking?
12. Release the plunger and your thumb, and again observe the marshmallow.



### INVESTIGATE

- Repeat the process with a marshmallow cut in half - can you see the air spaces growing and shrinking?
- Measure the marshmallows before and during the process - think about how you will do this - and estimate the % increase and decrease in size.

### WHAT IS HAPPENING?

The movement of the plunger in the syringe increases and decrease the volume of the air, which changes the pressure - the same as happened in the “syringe kettle”. This change in air pressure affects the size of the microscopic air bubbles that give the marshmallows their spongy nature.

And so it is with the tissue in human lungs - we breathe because our expanding and contracting ribcage changes the pressure on the tiny alveoli (air pockets), filling them with air.

### EXPLORE MORE...

A short animation shows explains the effect of pressure on our human breathing system at <https://www.youtube.com/watch?v=Mf8xTqfssp4>

Instructions to make your own simplest model of the lung is shown here at *Science Matters* - <http://science-mattersblog.blogspot.ie/2010/12/body-systems-respiratory-system-model.html>