WARNING! If you have chosen a dead insect as your specimen, wash your hands after touching it.

Create a microscope out of rubbish

Reuse leftover junk from around your home to build a functioning microscope.

What you need

- Thin card (you could use an old greeting card or cereal packet)
- Pencil
- Ruler
- Scissors
- Clear cellophane (we used a wrapper from a birthday card)
- Sticky tape
- Cardboard tube, for example, from wrapping paper or toilet roll
- Plain white paper
- Paper straw
- Specimen to view, such as a strand of hair, a leaf, grains of rice or a dead insect

DID YOU KNOW?
The earliest microscopes were known as flea glasses because people used them to study small insects.

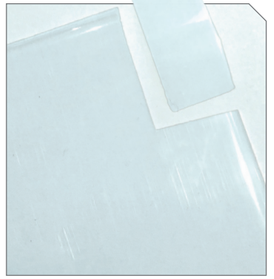
TOP TIP
If you haven't got any cellophane, stretch some clear food wrap over the card and tape it in place.

Real-world science

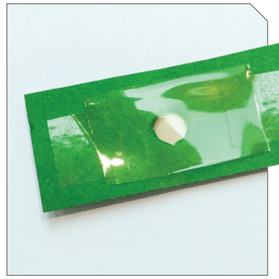
Dr Steve Lee from the Australian National University has created a new process to make microscope lenses out of drops of silicone. The drops of silicone are baked in an oven so that they harden onto special glass slides, which can be used like the cardboard slide you will create when you make this microscope. A silicone drop acts as a magnifier, just like a water droplet. For now, the silicone lenses are not as powerful as microscope lenses, but since they only cost about 1p, they are making science more accessible, especially in developing countries.

1 Cut a rectangular piece of card 2.5 centimetres wide by five centimetres long.

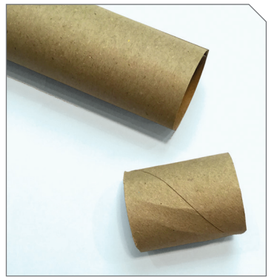
2 Use the point of a pencil to make a hole in the centre of the card. Push the pencil through to enlarge it.



3 Cut a piece of cellophane 1.5 centimetres by three centimetres. Put it over the hole in the card.

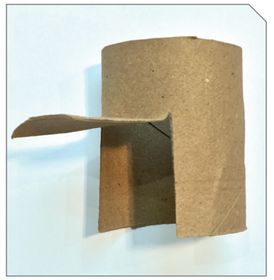


4 Secure the cellophane strip with sticky tape – a small piece at each of the shorter ends.

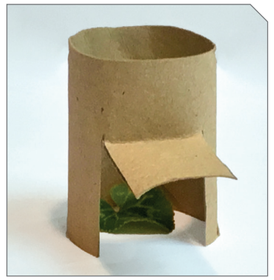


5 Measure and cut five centimetres up from one end of the cardboard tube to make a mini-tube.

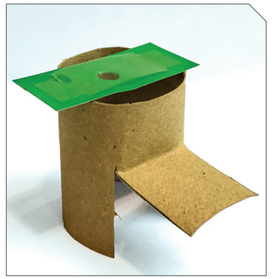
6 Draw two vertical lines three centimetres long and 2.5 centimetres apart. Cut along them.



7 Carefully lift up the cardboard flap to make a window.



8 Stand the tube on a sheet of plain white paper.



9 Now, place the piece of card with the plastic wrapping stuck to it over the top of the cardboard tube.

10 Transfer a drop of water from a straw on to the plastic wrapping. Make sure it completely covers the hole.

11 Place your specimen inside the tube and look at it through the drop of water. What do you see?

DID YOU KNOW?
Zacharias and Hans Janssen created the first compound microscope (a microscope that contains at least two lenses) in the 1590s.

How does it work?

Have you ever looked at an object through a magnifying glass and been amazed by what you see? Your homemade microscope works in a similar way. A magnifying glass has a convex lens. This means that it is thicker in the middle and thinner around the edges. The lens bends light travelling through it, causing objects underneath to look much bigger than they really are.

The water-drop used in this homemade microscope works in the same way. Because a water droplet bulges in the middle and is thin at the edges, it results in a magnified image. The water drop can give between five to 10 times magnification, depending on its size. The smaller the drop the greater the magnification, because the surface is more curved.