

INVISIBLE INK

Make invisible ink and turn your family into super-secret agents. This simple recipe creates an ink that only those who know the secret will be able to read.

You will need:

- Half a lemon or a bottle of lemon juice
- A spoon
- Water
- A bowl or cup
- A small paint brush
- White paper
- A lamp or lightbulb turned on (so it is hot)



How to write a secret message

- 1 → Squeeze the lemon juice into the bowl.
- 2 → Add a couple of drops of water and mix using the spoon.
- 3 → Dip the brush in the mixture and use it as a pen to write your secret message on the paper. Then wait for your message to dry and turn invisible on the page.

→ To **read** the message carefully hold the paper up to a light bulb **to heat the paper and reveal the message**. Be careful not to touch the hot light.

What do you think is happening? Do you know anything about **lemon** juice that might give you a hint?

Discuss with your family
before reading on.



SPOILER ALERT

So what is happening?

You might know that the lemon juice is acidic, it's why you've got to be careful not to get any in your eyes.

When you apply the acidic lemon juice to the paper the acid in it **breaks down some of the paper fibres**, breaking up the paper and **releasing carbon on the surface**.

The lemon juice is also an organic material and contains **carbon** too.



As you heat the paper **the carbon on the surface is heated up and is oxidised, turning much darker**.

The bits of the paper where you haven't applied lemon juice don't have all that extra carbon, **so it stays white**.

Now try some other fruit juices like lime and orange juice, and record which one is the best for writing messages!

Why not write a message below to practise?

