

# Learn to Light:

**Rainbows** Rainbows are formed when light shines through water, like when the sun shines through the rain. As the light passes from the air to the water, the light is bent (this is called refraction) and reflected (like a reflection in a mirror). This process splits the white light into all the colours of the rainbow. Rainbows can happen wherever light is being bent inside water droplets such as fog 'fogbows'.



## Experiment

Make a rainbow

You will need:

A glass

A small mirror

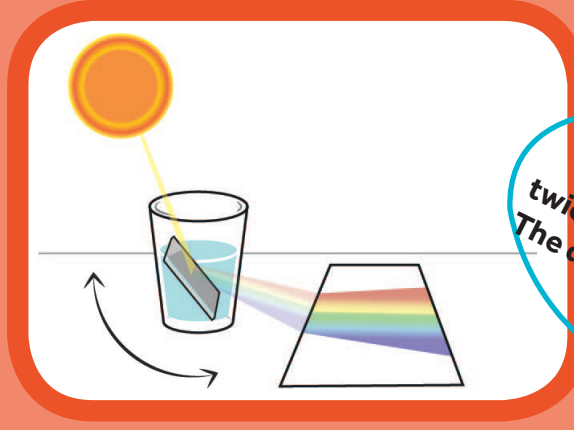
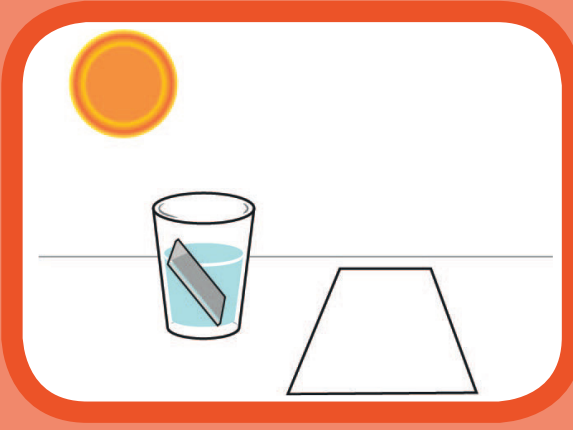
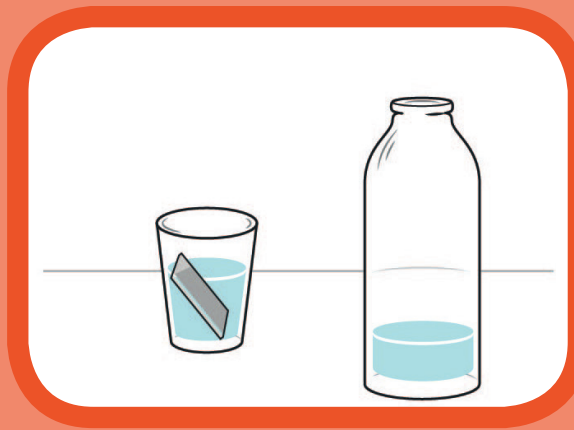
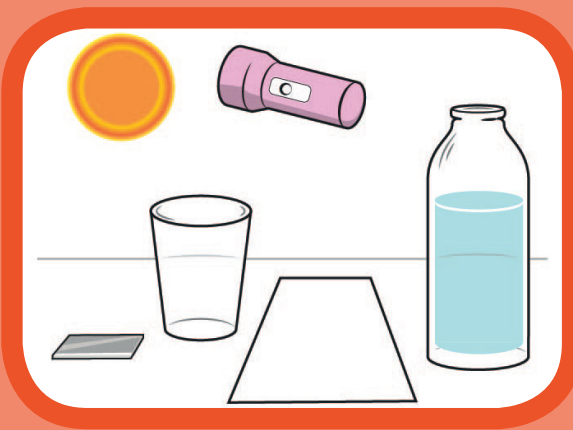
A piece of white paper

Direct sunlight/torch

Some water

Some magic!

1. Fill the glass with water and place the mirror in it.
2. Place the glass in direct sunlight or shine a torch onto the mirror. Place the paper on the other side of the glass.
3. Adjust the angle of the mirror until you see the rainbow.



## FUN FACTS

In many cultures rainbows symbolise hope because they often appear when a storm is passing and the sun is coming out again.

There is no end to a rainbow. Rainbows are actually full circles. But from the ground we can only see part of the rainbow so we see them as an arc.



Double rainbows are very rare. You get them twice inside the water droplets. The dark area between is called Alexander's Band.

Moonbows are created by moonlight rather than sunlight and normally appear white.



## Findings

How many colours can you see in your rainbow ?

Can you touch a rainbow ?

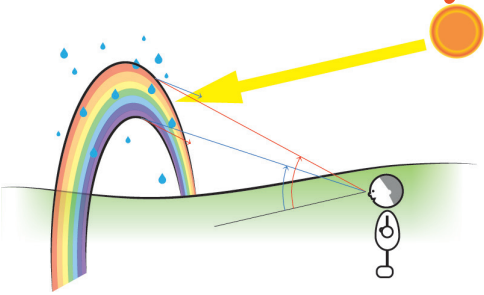
What shape is a rainbow ?

R \_ \_ O \_ \_ \_ Y \_ \_ \_ G \_ \_ \_ B \_ \_ \_ I \_ \_ \_ \_ V \_ \_ \_ \_

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**Conclusion** The angle of the light hitting the water effects how we see rainbows. The sun needs to be behind us and the rain in front of us in order to see a rainbow. The sun needs to be low in the sky, at an angle of less than 42° above the horizon. What makes rainbows so special is that no two people see exactly the same thing.

CAN YOU DRAW A RAINBOW?



Where else CAN you see A RAINBOW?

Colour them in...



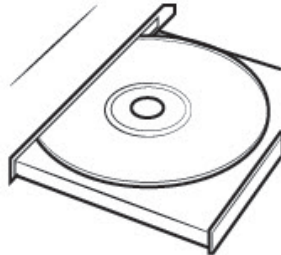
A ribbon



A crystal



A fountain



A CD



A bubble



An owl

WHAT DO YOU THINK A LEPRECHAUN looks like?

Leprechauns, small fairies dressed in green, are known to be practical jokers who love to play tricks on humans. Irish legends hold that leprechauns hide their gold in a pot at the end of a rainbow. Do you believe the legend or is it one of their tricks?



Grown-ups: You can also try creating a rainbow in the following ways; shining a light source on a CD or through a prism - if you are using a torch rather than the sun try doing it in a dark space. Using a water hose in very bright sunlight - stand with your back to the sun, put your thumb over the end of the hosepipe to get a fine spray of water, look at the spray against a dark background such as a fence and adjust your position until you can see a rainbow.

Answers: FINDINGS - 7, no, circle, red orange yellow green blue indigo violet LEPRECHAUNS - it's a trick, rainbows are circular so there is no end WHERE ELSE - a crystal, a fountain, a CD, a bubble