



Glass Lens

This neat bit of science is about showing how curved glass can act as a lens.

Safety considerations:

Glass is used in this activity. It is recommended that teachers undertake a [Curriculum Activity Risk Assessment \(CARA\) process](#). It is recommended that students are briefed as to the risks of cuts and the use of gloves when handling materials should be considered.

Aim:

To make a lens and use it to reverse how something looks.

Materials:

A round glass (you may need to experiment to find the best one), water, paper with something drawn on it (like an arrow) and a shiny spoon.

What to do:

The Spoon

It isn't made of glass, but a shiny spoon can still bend light in similar ways to a lens. Look at your reflection on both sides of a shiny metal spoon.

The Glass Lens

Fill your glass with water and draw an arrow on a bit of paper. Place the glass between your eyes and the arrow drawn on your piece of paper, and experiment with the distances until the arrow appears to reverse direction.

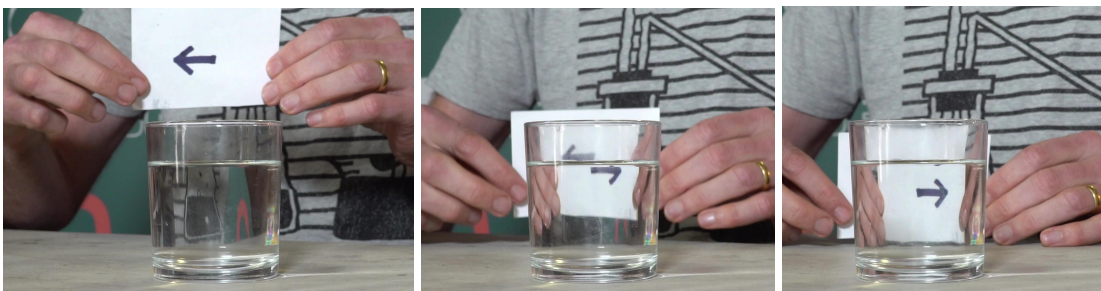
What's going on and what did you find out?

The Spoon

On the back of the spoon (a convex mirror) you will appear a bit squashed. This is due to the curve of the spoon reflecting light outwards as it bounces it back to you (instead of straight back, like a flat mirror). As the light spreads out, it causes your reflection to appear smaller. Looking into the front of a spoon (a concave mirror) is a different story. You appear upside down and your left and right are swapped (compared to a flat mirror). The curved surface is this time bouncing the reflections back inwards, and they go so far that they cross over with reflections coming from the opposite side of the spoon. This is essentially why you appear reversed and upside down.

The Glass Lens

The effect here is similar to the front of the spoon, but instead of reflecting the light, the glass and water in it bend the light inwards. The glass lens has a focal point, like most lenses, and the distance your eyes and the arrow are from the focal point will affect how well this works.



Extension ideas and real world links:

Try and discover words that change, or stay the same when reversed with your lens.
Can you make the same effect with a magnifying glass?

Mirrors and lenses like these (but much more accurate) are used in telescopes to reflect and magnify the night sky. They are also used in microscopes to see the tiniest details.



Curriculum links:

(ACSSU080) Light from a source forms shadows and can be absorbed, reflected and refracted.

(ACSHE081) Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions.

(AC SIS231) With guidance, pose clarifying questions and make predictions about scientific investigations.

(AC SIS086) Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risks.

(AC SIS218) Compare data with predictions and use as evidence in developing explanations.