

# Ghostly hand



## Location

First floor, Curiosity zone exhibition

## In a nutshell

With this exhibit investigate how the reflection from a concave (cave-shaped) mirror is different from an everyday plane (flat) mirror. Can you shake hands with your own reflection?

## What to do

Slowly move your hand towards the concave mirror, notice how the image of your hand seems to be in front of the mirror rather than behind as with a plane (flat) mirror. Try to shake hands with yourself.

## Time Required

KS3 & KS4 2-3 minutes per student.

## What's happening?

When you look into a plane (flat) mirror your reflection appears to be behind the mirror at the same distance as you are from the front of the mirror, this is called a virtual image. Reflections from a concave (cave-shaped) mirror are different as at certain distances from the mirror a real image is created. A real image is one that can be projected onto a screen as the light rays are focussed at a point in front of the mirror. As the image is in front of the mirror it appears you can touch it. The virtual image created using a plane (flat) mirror is the same way up as the object however the real image produced at certain distances using a concave mirror is inverted. The image produced using a concave mirror also changes in size greatly as the object's distance from the mirror changes. Using a plane (flat) mirror the image size always appears to match the size of the object with no magnification. As the object is moved closer to the concave mirror it acts more like a plane (flat) mirror with a virtual non-inverted image produced.

### Curriculum links

Curriculum links	
<b>KS3</b>	<p><b>Science - Light waves</b></p> <ul style="list-style-type: none"> <li>- the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface</li> <li>- use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye</li> </ul> <p><b>English - Reading</b></p> <ul style="list-style-type: none"> <li>- learning new vocabulary, relating it explicitly to known vocabulary and understanding it with the help of context and dictionaries</li> </ul>
<b>KS4</b>	<p><b>Science - Frequency range of the spectrum</b></p> <ul style="list-style-type: none"> <li>- recall that light is an electromagnetic wave</li> </ul> <p><b>Science - Interactions of electromagnetic radiation with matter and their applications</b></p> <ul style="list-style-type: none"> <li>- recall that different substances may absorb, transmit, refract, or reflect these waves in ways that vary with wavelength; explain how some effects are related to differences in the velocity of the waves in different substances</li> </ul> <p><b>English - Spoken</b></p> <ul style="list-style-type: none"> <li>- listening to and building on the contributions of others, asking questions to clarify and inform, and challenging courteously when necessary</li> </ul>

## Relates to:

Workshops & Theme Days	Shows	Trails	Other exhibits
<ul style="list-style-type: none"> <li>• Colourful Chemistry (KS3)</li> <li>• Light and Shadow (KS2)</li> </ul>	<ul style="list-style-type: none"> <li>• Light Fantastic (KS2)</li> </ul>		<ul style="list-style-type: none"> <li>• Topsy turvy mirror</li> <li>• Focusing light</li> <li>• Spectra</li> <li>• Vein viewer</li> <li>• Infinity well</li> </ul>

