



## Light Fantastic KS1 duration: 30 minutes

With laser beams, an infrared camera, smoke and mirrors and invisibility, this highly visual and phenomenon-based show explores the true nature of this amazing form of energy to reveal what light is, what emits it, and how it travels.

### Key Words:

#### KS1-KS3

Light, Energy, Colour, Invisibility, Reflection, Lasers, Flame guns, Fluorescence, Eye, Shadows

#### KS2-KS3

Refraction, Absorption, Transmission

### Learning objectives

#### KS1

Understand that shadows are cast by opaque objects blocking light.

#### KS1-KS3

To learn about the ways in which light can be given out (emitted) from a variety of sources by processes including heating, electricity, chemical reactions, and fluorescence.

That there are different colours and types of light.

That other types of electromagnetic energy - waves (infrared and ultraviolet) can be seen by certain animals, and by using other detectors, such as infrared cameras.

#### KS2-KS3

Understanding light can help us to explain a range of observed, natural phenomena and to apply it in useful ways.

To appreciate that scientific vocabulary can be used to describe the observed behaviour of light, including transmission, absorption, reflection, and refraction.

That we perceive visible light when it enters our eyes and forms an image there that is transmitted to our brain.

### Content

#### KS1

See how shadows are formed

#### KS1-KS3

Experience spectacular demonstrations that create light in a variety of memorable and exciting ways

Have many opportunities to volunteer and participate in practical demonstrations

Watch flame guns used to produce a range of coloured light

See how a Plasma Ball can light up a fluorescent tube

See how reflection can change the direction of a laser beam

Observe demonstrations of chemiluminescence reaction

Participate in demonstrations using infrared imaging, ultraviolet light, light-sabre battles, and invisibility

#### KS2-KS3

See how understanding the refractive index can be used to make things invisible

See how a laser can be used to magnify

### Curriculum Links:

#### KS1

#### Working scientifically

Asking simple questions and recognising that they can be answered in different ways

Using their observations and ideas to suggest answers to questions



## KS2-KS3

**Year 3: Light** Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces

**Year 6: Light** Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes

**KS3 Physics: Motion and forces** Light waves travelling through a vacuum; speed of light. The transmission of light through materials; absorption, diffuse scattering and specular reflection at a surface. Use ray model to explain imaging in mirrors, the refraction of light

## Potential Hazards and accessibility

Class 3 LASER used in show but is mounted to the ceiling and will not be able to shine into students' eyes. Chemical hazards include luminol, hydrogen peroxide, and ethanol, but are only used by the presenter as a demonstration. Flame spray gun will be used by presenter. A Plasma Ball will be used to generate a spark. Individuals with a pacemaker may prefer to move to the back of the studio for this demonstration.