



## **A Trick of the Light** UKS2/KS3/KS4

Duration: 1 hour, Max capacity: 30 students

A fantastic and fun introduction to the properties of light and the electromagnetic spectrum. Fascinating exhibits are used to explore reflection, wavelength, phosphorescence, and UV before teams are challenged to apply what they have learned and solve a set of light-related puzzles, get the code to a smoke machine and successfully navigate a laser maze to claim a gold bar.

### **Key Words**

Light. Reflection. Absorption. Wavelength. Laser. UV. Colour. Phosphorescence. Electromagnetic spectrum. Puzzles.

### **Learning objectives**

Understand that light is composed of different colours with different wavelengths  
Understand why coloured objects appear different in different coloured light  
Recognise that when light hits an object it may be reflected, refracted or absorbed  
Use ray models to represent imaging in mirrors  
How reflection can be used to create an 'infinity mirror'  
To understand the terms phosphorescence and fluorescence, and how each is produced  
Understand why certain materials fluoresce in UV light

### **Content**

Investigate the properties of light using intriguing, purpose-built exhibits, including a phosphorescent 'freeze your shadow' screen, coloured visible lights, an ultra-violet chamber, lasers, and an 'infinity mirror'  
Work in teams to complete investigation sheets that consolidate their learning and relate the phenomena to everyday life  
Use what they have learned to solve a series of exciting challenges - applying each property of light in turn and working against the clock (and the other teams!)  
Each team attempts to retrieve gold bar by navigating the laser maze in the shortest time and without breaking the beams that set off an alarm

### **Curriculum Links**

#### **KS2:**

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.  
Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

#### **KS3:**

Investigate the properties of light using intriguing, purpose-built exhibits, including a phosphorescent 'freeze your shadow' screen, coloured visible lights, an ultra-violet chamber, lasers, and an 'infinity mirror'  
Work in teams to complete investigation sheets that consolidate their learning and relate the phenomena to everyday life  
Use what they have learned to solve a series of exciting challenges - applying each property of light in turn and working against the clock (and the other teams!)

# we the curious Workshop



Each team attempts to retrieve gold bar by navigating the laser maze in the shortest time and without breaking the beams that set off an alarm

**KS4:**

Transmission of light through materials: absorption, diffuse scattering, and specular reflection

Use of ray model to explain imaging in mirrors

Light transferring energy from source to absorber leading to chemical and electrical effects: Photo-sensitive materials

Colours and the different frequencies of light, white light and prisms: differential colour effects in absorption and diffuse reflection

Uses in the radio, microwave, infra-red, visible, ultra-violet, X-ray and gamma ray regions.

Velocities differing between media: absorption, reflection, refraction effects

**Potential Hazards and accessibility**

The classroom will be darkened, reduced light levels for significant parts of the workshop.

The laser maze uses Class 3 lasers in which the laser is deactivated immediately the beam is interrupted.

UV is damaging to eyes if stared at directly.

A bright camera flash is used for the phosphorescent screen.