Year 6 - Swans
(B)

Science - Light (Physics Yr 6)

Essential Question - Can you play with Light?

Spring 2

What I should already know : Children have previously learnt how to recognise that they need light in order to see things and that dark is the absence of light. They have also learnt how to notice that light is reflected from surfaces. The children learnt that light from the sun can be dangerous and that there are ways to protect their eyes. They should also be able to recognise that shadows are formed when the light from a light source is blocked by an opaque object and find patterns in the way that the size of shadows change.

Enquiry Questions:

1. How does light travel?
2. Do all surfaces reflect light?
3. How does reflection help us to see?
4. Are shadows always the same shape/size?
5. Why do shadows have the same shape as the object that cast them?
6. What is light phenomena?

Key Vocabulary

Absorbtion: When a wave comes into contact with a medium and causes the medium's molecules to vibrate and move. This vibration absorbs or takes some of the energy away from the wave and less of the energy is reflected.
Dark (scientific): Dark is the absence of light. (everyday): Almost no light.
Image: An image is a picture of how you see objects when light from them reaches your eyes.
Light: Light is the form of energy that makes it possible for us to see things with our eyes.
Light ray: A light ray is a straight line showing the direction of travel of light.
Light source: A light source emits (gives out) light. It can be natural or man-made.
Mirror: Any glass or other smooth, polished surface that forms an image by reflection
Natural light source:
Opague: Opaque materials/objects block all light.
Ray diagram: A ray diagram is a drawing showing the straight-line paths that light travels in from a light source to the eye, often reflecting off objects on the way.
Reflect: Light reflects when it 'bounces back' off a surface or object. All objects reflect some light otherwise we couldn't see them.
Reflection: an image given back by a reflecting surface.
Refraction: Refraction happens when light changes direction, or bends, when it moves from one material to another.
Scatter: If a light ray scatters it changes direction to a different random direction.
Shadow: Shadows are formed when an opaque object is placed in the path of light rays.
Shiny: Reflecting or glowing with light
Spectrum - a band of separate colours
Straight lines: A straight line continues in the same direction and does not curve.
Sunlight: The light and energy that comes from the Sun.
Surface: The outside limit or top layer of something.
Torch: A small electric light which is powered by batteries.
Transparent: Transparent materials look clear, as all light passes through them.
Translucent: Translucent materials block some of the light and scatter the rest. This makes the images appear blurred.
Variable - any one of the elements of an experiment which could be changed

Scientific Skills

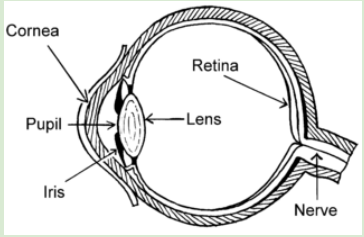
Skills and Knowledge (Light)
Pupils will:
(1) recognise that light appears to travel in straight lines..
(2) use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
(3) explain that we see things because light travels from light sources to objects and then to our eyes
(4) use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

(Working Scientifically) Year 6
WS1) plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
WS2) identify scientific evidence that has been used to support or refute ideas or arguments. .
WS3) take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where possible.
WS6) u use test results to make predictions to set up further comparative and fair tests.
WS7) record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.
WS8) gather & record data to help answer questions
WS9) report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree and trust in results, in oral and written forms such as displays and other presentations.
Pupils should read and spell scientific vocabulary correctly.

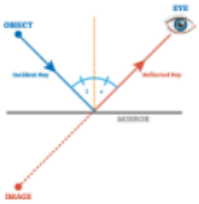
Significant People

Sir Isaac Newton - (25 December 1642 – 20 March 1726/27) - discovered that sunlight falling upon a prism could split into its component colours. This process is known as dispersion. Newton named the component colours: red, orange, yellow, green, blue, indigo and violet. Most of these are easy to distinguish except for indigo. Legend has it that Newton included indigo because he felt that there should be seven rather than six colours in a rainbow due to his strong religious beliefs.

Human eye



Bending Light



Reflection

Light reflects off shiny, bright or light surfaces. That is why you can see your reflection when you look in a mirror.

Refraction

Water and bent shiny surfaces cause light rays to be reflected at different angles, meaning the reflection of the image is distorted.

Interesting Facts

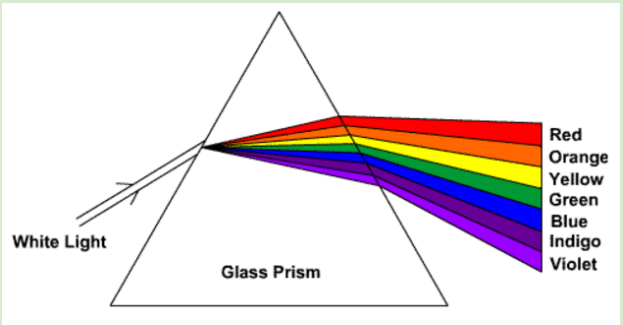
Light arrives on our planet after a speedy trip from the Sun, 149 million km (93 million miles away). Light travels at 186,000 miles (300,000 km) per second, so the light you're seeing now was still tucked away in the Sun about eight minutes ago. Put it another way, light takes roughly twice as long to get from the Sun to Earth as it does to make a cup of coffee!

Other animals can see parts of the spectrum that humans can't. For example, a large number of insects can see ultraviolet (UV) light.

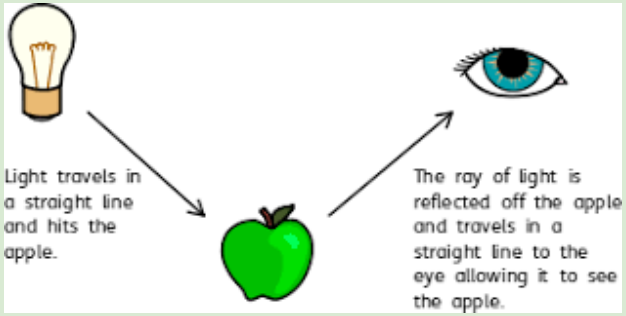
UV light can be used to show things the human eye can't see, coming in handy for forensic scientists.

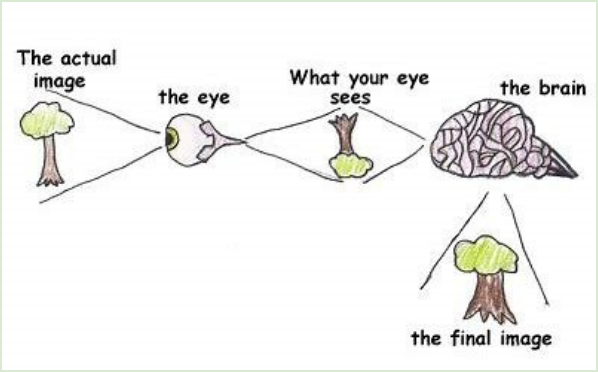
Sunlight can reach a depth of around 80 meters (262 feet) in the ocean.

Refraction through a prism.



How we see...





Links to Other Areas of the Curriculum: Maths - difference in speed between light and sound