

**Science: Light**

**Definition:** Light: It is something that makes things visible or affords illumination.

**Physics definition:** Physics is the study of nature and how matter and energy behave.

- POS:**
- 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

**Prior learning Year 3:**

- 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
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that the size of shadows change

**Links to other science topics:**

- Sound
- Everyday materials

**Disciplinary concepts:**

**Process** – how do we see?

**Cause and effect** – why do only some objects make shadows?

**Common misconceptions:**

Children often think that light is only found in bright places. They know that dark is the opposite of light, so assume that if it's dark, there must not be any light around at all. In reality, even on a dark night there will always be some light present. If possible, black out the classroom and ask the children what they can see once their eyes have adjusted to the dark.

When asked to explain how we see things, children may draw arrows coming out of a person's eyes and hitting objects. Really, it is the opposite way round: light travels from the objects to our eyes.

**Core Knowledge:**

- To demonstrated that light travels in a straight line and talk about this confidently.
- To use diagrams to show that light travels from a light source, reflects off objects and into our eyes, enabling us to see things.
- To explore shadows on several occasions and each time linked the formation of shadows back to the fact that light travels in a straight line.

**Wider Knowledge:**

- Thomas Edison (February 11, 1847 – October 18, 1931) was an American inventor and entrepreneur, who invented many things. Edison developed one of the first practical light bulbs, but contrary to popular belief did not invent the light bulb.
- Joseph Wilson Swan (31 October 1828–27 May 1914) was an English physicist and chemist who was well known because he created the incandescent light bulb, about a year before Thomas Edison.
- Lights by Monica Hughes - Band 03/Yellow

**Working scientifically:**

- Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results.
- Measure using standard units using equipment that has scales involving decimals
- Prepare own tables to record data, including columns for taking repeat readings
- Be able to answer their questions, describing the change over time
- Be able to answer their questions identifying patterns
- Provide oral or written explanations for their findings
- Use test results to make predictions for further investigations
- Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled, and accuracy of results

**End Goals:**

- To identify that we need light to be able to see things.
- To know light waves travel out from sources of light in straight lines.
- To explain that light from the sun travels in a straight line and hits the chair. The light ray is then reflected off the chair and travels in a straight line to the person's eye, enabling her to see the chair.

**CPD:** Reach out CPD

Science Association / STEM website

**Enrichment:**