

Knowledge Organiser - Year 3 - Science: Light



Light waves travel out from their source in straight lines called rays, then into our eyes and allow us to see.

Key Vocabulary

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| Block | To hide or cover something so that it cannot be seen. |
| Dark | With little or no light in a place. |
| Earth's axis | Earth rotates on an axis point. An axis is an imaginary line an object turns around. This imaginary line runs directly through the object's centre, from the north to the south poles. Although we can't feel the Earth spinning, it makes one complete turn, each day, around its own axis. |
| Light source | Something that provides light, whether it be a natural or artificial source of light (e.g. the sun, a torch). |
| Mirror | A very smooth surface, typically of glass coated with a metal mixture, which reflects a clear image. |
| Opaque | Not able to be seen through; not transparent. Completely blocks the light. |
| Rainbow | An arch of colours visible in the sky, caused by the spreading out of the sun's light by rain or other water droplets in the atmosphere. |
| Reflection | The bouncing back of light, by a body or surface without absorbing it. |
| Shadow | A dark area or shape produced by an object coming between rays of light and a surface. An area with no light. |
| Surfaces | The outside part or uppermost layer of something. |
| Transparent | Allowing light to pass through an object, so that objects behind can be clearly seen. |
| Translucent | Allowing some light, but not detailed shapes, to pass through; semi-transparent. |
| Ultra Violet | Part of the light ray that has a wavelength shorter than the violet end of the visible spectrum. It's invisible to the human eye. |
| Vitamin D | When skin is exposed to the sun, our bodies make vitamin D, which helps the body absorb calcium for stronger, healthier bones. |

Working Scientifically

Pupils should classify whether something is a light source or simply reflects light. They should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure shadows, and find out how they are formed and what might cause the shadows to change. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.

Key Question: What makes a shadow?



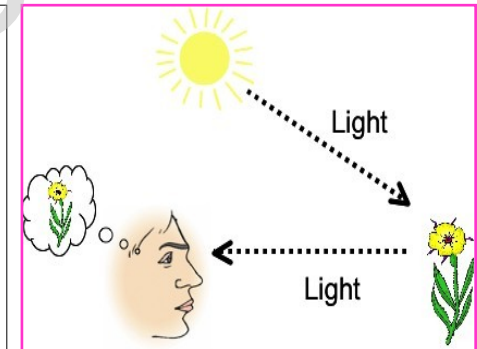
These objects are all light sources, they produce their own light.

We need light in order to see things. Darkness is the absence of light. Light travels either directly from a light source to our eyes, or some objects reflect light which then enters our eyes, but are not light sources themselves. The moon is an example of this.

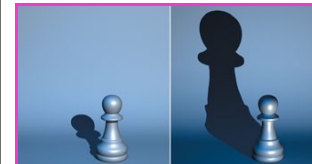
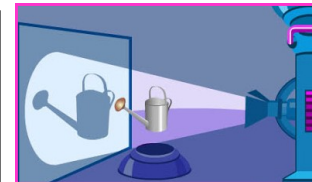
We also use reflective materials to help us see objects in the dark, like street signs, 'cat's eyes' in the middle of the roads and people wearing reflective clothing. All of these things reflect light from a source into our eyes, but are not light sources themselves.

Light is reflected by bouncing off surfaces and then entering the eye. The man sees the flower only after the light has bounced off it. The Moon shines because it reflects light from the Sun. Smooth surfaces, like mirrors, reflect light in one direction. Rough surfaces bounce light in every direction so don't give a clear image.

Although we all need some sunlight so that our bodies can make vitamin D, Light from the sun can be dangerous, you should always protect your eyes and never look directly at the sun. The sun gives off Ultra violet light which is also harmful to the skin. So wearing a hat, sun tan lotion and keeping skin covered is a good idea.



Sometimes a shadow is caused by a light source like a lamp or torch shining on an object and the shadow is behind the object where the light is being blocked. You can also change the size of the shadow by moving the torch nearer to, or further away from the object, or by moving the object itself.



Shadows are formed when the light from a light source is blocked by an opaque object, like the tree in this picture. The shadow is the same shape as the object, but can change size depending on how high in the sky the sun appears to be. Remember, in this case, it is not the sun moving, but actually the Earth turning on its axis that makes it appear that the sun is moving across the sky. The higher the sun (at midday), the shorter the shadow. The lower the sun in the sky (early or late in the day), the longer the shadow. The sun rises as the Earth turns and we are facing the sun. The sun sets when we turn away from the sun and face out to space (darkness).