

Key Stage 2 History – Energy

Energy: Light and reflection

Expected Outcomes

Pupils will be able to:

- Compare sources of light and explain how the eye is protected from light.
- Describe how light travels and how we see luminous and non-luminous objects.
- Recall factors that affect the size of a shadow and describe how the distance between an object and the surface its shadow is cast on affects the size of the shadow.
- Use ray diagrams to explain why shadows change size and why the shape of a shadow matches the object that was cast.
- Recall what happens to light when it reaches a smooth mirror surface.
- Identify the incoming and reflected rays and describe the relationship between their angles.
- Use mirrors to make a working periscope and explain how a periscope works using ray diagrams.
- Recall a range of uses of mirrors and reflection, describe how a mirror reflects light in different situations and explain how light is reflected using knowledge of light and reflection.

Developmental Focus Opportunities

- Compare and classify sources of light (natural vs artificial; luminous vs non-luminous).
- Explore how the eye is protected from light (e.g. eyelids, pupils, sunglasses).
- Investigate how light travels in straight lines using torches and barriers.
- Use ray diagrams to show how we see objects and how shadows are formed.
- Experiment with shadow size by changing the distance between object and surface.
- Explain why shadows match the shape of the object using light path diagrams.
- Observe how light reflects off smooth surfaces like mirrors.
- Identify and label incoming and reflected rays and measure angles.
- Build and test a working periscope using mirrors and explain how it works.
- Explore real-world uses of mirrors and reflection (e.g. telescopes, safety mirrors, architecture).

Key Learning Points

- Sources of light can be natural (e.g. sun) or artificial (e.g. torch), and luminous objects give off light.
- Non-luminous objects do not produce light but can reflect it.
- The eye is protected from light by features like eyelids, pupils, and tools like sunglasses.

Powerful Knowledge

Light helps us see the world around us. It travels in straight lines and can bounce off surfaces like mirrors. Some things give off light (like the sun or a torch), while others just reflect it. Our eyes are protected from bright light by parts like eyelids and pupils. Shadows are made when light is blocked, and they always match the shape of the object. We can use diagrams to show how light travels and how we see things. Mirrors are used in lots of clever

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- Light travels in straight lines, which can be shown using torches and barriers.
- Ray diagrams help explain how we see objects and how shadows are formed.
- Shadow size changes depending on the distance between the object and the surface.
- Shadows match the shape of the object because light cannot bend around it.
- Light reflects off smooth surfaces, like mirrors, following predictable angles.
- Incoming and reflected rays can be labelled and measured to show reflection.
- Periscopes use mirrors to reflect light and allow us to see around corners.
- Mirrors and reflection are used in real life (e.g. telescopes, safety mirrors, architecture).

ways, like in periscopes, telescopes, and even buildings to help us see better or stay safe.

Subject-Specific Vocabulary

Anomaly
conclusion (LKS2)
control variable (LKS2)
evaluate
evidence
fair test
light ray
line graph
line of best fit
mean average
pupil
ray diagram
reflective
relationship
reliable
scale
testable

Units

Reading Opportunities

Science in a Flash: Light by Georgia Amson-Bradshaw
Foxton Primary Science: Light (Upper KS2) by Nichola Tyrrell
Heroes of Light and Sound by Joy Lin & Alan Brown
The Speed of Starlight by Colin Stuart & Ximo Abadía
Light: Shadows, Mirrors, and Rainbows by Natalie M. Rosinsky

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Possible Misconceptions	Cross-Curricular Links
Light can bend around corners All objects give off light Shadows are caused by darkness Mirrors create light The angle of reflection is different from the angle of incidence	English: Spoken language; Writing – composition. Mathematics: Number – addition, subtraction, multiplication and division; Statistics History. Art and design. British values: Mutual respect; Democracy; Rule of law.