

Topic:	Year group	Term
Light	3	Spring

Background knowledge

This is the first time that children have explored light and therefore they may have some common misconceptions about light and how it is produced. Children explore the difference between natural and artificial sources of light. They should be given opportunities to sort and group different light sources based on these two categories.

Children learn about some of the harmful effects of the Sun and explore ways to protect their eyes from the Sun's rays. It is important that children are aware of how to keep safe in the Sun and they should understand that they should never look directly into the Sun. They should also explore the different ways that they can keep their eyes safe during daylight hours. Link this step to real-life contexts as much as possible by using scenarios such as "going to the beach" or "a trip to the park". Encourage children to think about appropriate materials to protect their bodies and eyes from the harmful effects of the Sun.

Children learn about the eye and how we see. Children should understand that light travels in straight lines. This can be modelled in the classroom using a torch beam on a surface. In Year 3, children only need to be able to simply explain how we are able to see objects. They should identify that we are able to see an object because light reflects off it, enters our eyes, and the brain processes this information.

Children explore the concept of shadows. Children have already looked at how we see objects but they may have some misconceptions around shadow formation. They should learn that a shadow is formed when light is blocked by an opaque object. In Key Stage 1, children used the terms "opaque", "transparent" and "translucent" to describe different materials.

Common misconceptions

- Children may think that translucent objects would cast clear, defined shadows because they are not completely transparent.
- Children may think a shadow is a reflection of the Sun.
- Children may think a shadow can only be created by the Sun rather than by other light sources.
- Children may think that all materials cast shadows.
- As we see with our eyes, children may think that our eyes produce light, rather than light is reflected into our eyes allowing us to see.
- Children may think that only shiny, smooth surfaces reflect light.

- Children may only recognise sunburn as a harmful effect of the Sun.
- Children may think that the Moon is a source of light as it can be seen in the night sky.

What should I already know?

Children should be aware that certain objects produce light for example a torch. They may also mention that the sun produces light.

I can observe and comment on the changes in the seasons including day length.

I can name the seasons and suggest the type of weather in each season.

I know it is not safe to look directly at the sun. (year 1)

National Curriculum Objectives / Key Skills	The Journey
• Recognise that they need light in order to see things and that dark is the absence of light. • Recognise that light from the Sun can be dangerous and that there are ways to protect their eyes. • Notice that light is reflected from surfaces. • 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. <u>Working scientifically</u> Identifying differences, similarities or changes related to simple scientific ideas and processes.	1. Light sources 2. The sun 3. How we see 4. Shadows 5. Opaque, translucent or transparent? 6. Plan - shadow experiment 7. Investigate - shadow experiment 8. Evaluate - shadow experiment

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.

Asking relevant questions and using different types of scientific enquiries to answer them.

Setting up simple practical enquiries, comparative and fair tests.

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

Scientific enquiry

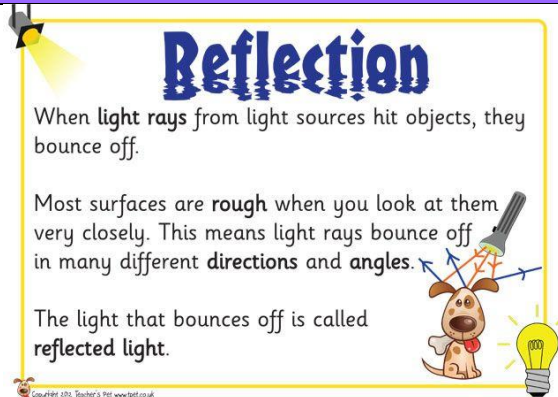
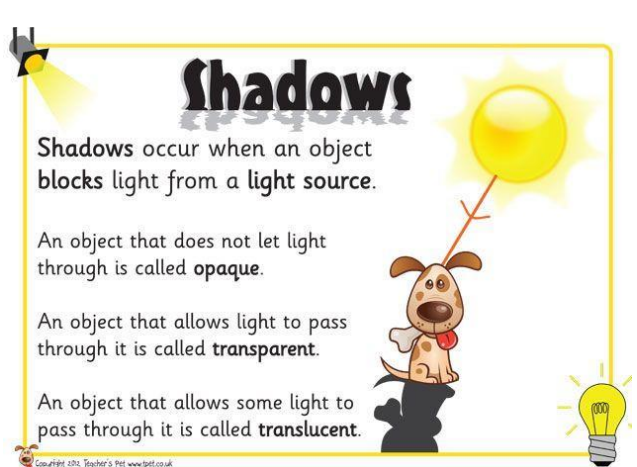


Outcomes

Working towards; I know we need light to be able to see and that darkness is the absence of light. I can name some light sources. I can observe how light is reflected off surfaces. I can sort materials into transparent, translucent and opaque and can investigate which material makes the best shadow. I can investigate with support how the size of a shadow changes in relation to its position to the light source. I can record my results in tables making simple measurements, and construct a bar chart with support saying what my results show. I know not to look directly at the sun.

Expected: I know we need light to be able to see and can explain that darkness is the absence of light. I can name several light sources. I can observe and explain how light is reflected off surfaces. I can sort materials into transparent, translucent and opaque and can determine which material makes the best shadow. I can investigate how the size of a shadow changes in relation to its position to the light source. I can record my results clearly in tables making simple measurements, and construct a bar chart saying what my results show. I know not to look directly at the sun explaining why.

Exceeding: I can explain we need light to be able to see and can explain that darkness is the absence of light. I can name a range of light sources. I can observe closely and explain clearly how light is reflected off surfaces. I can sort materials into transparent, translucent and opaque and can determine which material makes the best shadow explaining why this is the case. I can confidently investigate how the size of a shadow changes in relation to its position to the light source. I can record my results clearly in tables making accurate measurements, and construct a clear bar chart saying what my results show. I know not to look directly at the sun explaining why.

Key Vocabulary	Timeline / Diagrams
Dark- the absence of light. Light- a brightness that lets you see things. Mirror- a piece of flat glass or shiny plastic that reflects light. Opaque- a material that doesn't let light through. Reflects- sends light back from its surface. Shadow- a dark shape on a surface that is made when light is blocked. Source- where something comes from. Translucent- a material that let some light through. Transparent- a material that lets light through.	 Reflection When light rays from light sources hit objects, they bounce off. Most surfaces are rough when you look at them very closely. This means light rays bounce off in many different directions and angles. The light that bounces off is called reflected light. Copyright 2012, Teacher's Pet www.tpet.co.uk  Shadows Shadows occur when an object blocks light from a light source. An object that does not let light through is called opaque. An object that allows light to pass through it is called transparent. An object that allows some light to pass through it is called translucent. Copyright 2012, Teacher's Pet www.tpet.co.uk

Key people / places

NUSTEM career- Lighting technician

Thomas Edison.

"There is no substitute for hard work"

"If we did all the things we were capable of, we would literally astound ourselves"

Assessment questions / outcomes

Can you name some light sources?

Why do we need light?

Can you reflect light onto the ceiling using a mirror? Explain what is happening.

Name some reflective materials. Why are they useful?

Sort the materials into transparent, translucent and opaque. Which material makes the best shadow?

How did you investigate how the size of a shadow changes?

What did your results show?

How would you make a shadow bigger?

What time of the day is your shadow at its shortest? Why?

How can you protect your eyes from the sun? Why do you need to do this?