

# Ashtree Primary School and Nursery Medium Term Plan for Science

## Year 6 Spring Term - Light Unit

### Prior Knowledge – Y3 - Light

Step 1 - name a number of light sources, including the **sun**, describe and compare some light sources, recognise that light travels from a source -

Step 2 - state that light sources are seen when light from them enters the eyes, recognise that they cannot see in the dark, explain that places are dark because there is no light and a light source is needed to help us see in such places

Step 3 - state that **reflections** can be seen in **shiny** surfaces, demonstrate **light travelling** using a torch and record **light bouncing** off a mirror

Step 4 - explain that they cannot see shiny objects in the dark because there are no light sources

Step 5 - recognise that when light is **blocked**, a **shadow** is formed, recognise that shadows are similar in shape to the objects forming them, explain that shadows are formed when light from a source is blocked

Step 6 - make observations of changes in **shadows**, state that even **transparent** objects block some light and form shadows, describe the difference in shadows cast by **opaque, translucent and transparent** materials, explore how to make shadows of different shapes and sizes

**Prior Skills – Y3** - with support, records and presents findings, sets up simple practical enquiries, comparative and fair tests with support, asks relevant questions and uses, with support, different types of scientific enquiries to answer them, beginning to make systematic and careful observation, reports on findings from enquiries, in simple scientific language, using oral and written explanations, Using model frames for support, gathers and records data in a variety of ways to help in answering questions, beginning to make systematic and careful observation.

**Key Vocabulary** **Reflection, transparent, translucent, opaque, periscope, luminous, non-luminous, absorb, direction**

### Key Knowledge

Step 1 - explore how light travels using torches and periscopes, describe reflection as light 'bouncing off' objects

Step 2 - understand that in order to be seen, all **non-luminous** objects must **reflect** light

Step 3 - diagrammatically represent light from sources and bouncing off **reflective** surface using arrows, draw diagrams to illustrate how light is travelling from the source to the eye

Step 4 - describe a variety of ways of changing the size of the shadow produced by an object

Step 5 - describe the relationship between the size of a shadow and the distance between the light source and an object

Step 6 - diagrammatically represent the formation of shadows using arrow convention

### Key Skills

Step 1 - uses their scientific experiences to explore and generate ideas and raise different types of questions

Step 2 - recognises the applications of specific scientific ideas

Step 3 - records and presents findings using the most appropriate method.

Step 4 - recognises and controls variables where necessary

Step 5 - draws valid conclusions, explains and interprets the results (including the degree of trust) using scientific knowledge and understanding (e.g. recognises limitations of data)

Step 6 - uses relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas

### **Curriculum Enhancements**

Create your own sundials

Link to a DT project



### **Suggested Activities**

Explore different ways to demonstrate that light travels in straight lines e.g. shining a torch down a bent and straight hose pipe, shining a torch through different shaped holes in card.

Explore the uses of the behaviour of light, reflection and shadows, such as in periscope design, rear view mirrors and shadow puppets.

### **Curriculum links**

Art – silhouettes

PSHE – sun safety

Science - Electricity

### **Possible Misconceptions**

Some children may think:

- we see objects because light travels from our eyes to the object

### **This will lead to . . .**

In KS3, the children will learn to,

- The similarities and differences between light waves and waves in matter. (KS3)
- Light waves travelling through a vacuum; speed of light. (KS3)
- The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. (KS3)
- Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. (KS3)
- Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. (KS3)
- Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. (KS3)