

# Ashtree Primary School and Nursery Medium Term Plan for Science

## Year 5 Autumn Term – Earth and Space

### Prior Knowledge – Y3 – Light – (see also Year 1 – Seasons)

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

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 - **light, travels, light source, torch, lamp, daytime, night-time**

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**

### Key Knowledge

- **Step 1** - identify and name the components of **the solar system** (i.e. **Sun, Moon, Earth** and other planets)
- **Step 2** - locate the **Sun, Earth** and other planets in the solar system and recognise that the Earth and other **planets orbit** the Sun
- **Step 3** - recall that the **Earth** takes one year to orbit the Sun and recall that the Earth rotates on its' **axis**, and this takes one day
- **Step 4** - recognise that the Moon orbits the Earth
- **Step 5** - recognise that the Earth, Sun and Moon are spherical and support this with some evidence
- **Step 6** - recognise that it is **daylight** in the part of the Earth facing the Sun and recall that a **shadow** from the Sun changes over the course of a day
- **Step 7** - explore and describe how a shadow from the Sun changes over the course of a day and explain in terms of the **rotation** of the Earth why **shadows** change, and the Sun appears to move across the sky during the course of the day
- **Step 8** - explain why it is night-time in Australia when it is daytime in England

**Prior Skills – Y3 - Step 1 - with support, records and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables, 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** for changes, patterns, and relationships in their data

**Key Vocabulary** - Earth, Sun, planet, Mercury, Venus, Mars, Jupiter, Moon, Saturn, Uranus, Neptune, solar system, spherical, moon, day and night, celestial body, rotation, hemisphere, orbit, shadow, daylight

### Key Skills

- Step 1 - records and presents findings using drawings, labelled diagrams,**
- Step 2 - records and presents findings using drawings, labelled diagrams,**
- Step 3 - sets up simple practical enquiries, comparative and fair tests**
- Step 4 - identifies differences, similarities or changes related to simple scientific ideas and processes**
- Step 5 - sets up simple practical enquiries, comparative and fair tests**
- Step 6 - sets up simple practical enquiries, comparative and fair tests**

### Curriculum Enhancements

- Visit observatory or planetarium.
- Visit from Airbus
- Models of solar system as part of the display.



### Suggested Activities

- S1 – What makes up our solar system? Create own mnemonic to remember the order of the planets. **02/11**
- S2 – Physical demonstration of how the planets move around the sun. **09/11**
- S3 – Physical demonstration of how the earth moves around the sun.
- S4 – Physical demonstration of how the moon moves around the earth. Look at the phases of the moon. **30/11**
- S5 – How do we know that the sun, earth and planets are spherical. Consider the work of scientists such as Ptolemy, Alhazen and Copernicus **16/11**
- S6 – Physical demonstration of how the earth moves around the sun. **24/11** [Day and night done here](#)
- S7 – Create a sun dial or shadow plotter to see how shadows change through the course of the day.
- S8 – Explain why it would be night-time in Stevenage but daytime in Australia. **Covered 24/11**

**S3/S6 -repetition**

### Possible Misconceptions

Some children may think:

- the Earth is flat
- the Sun is a planet
- the Sun rotates around the Earth
- the Sun moves across the sky during the day
- the Sun rises in the morning and sets in the evening
- the Moon appears only at night
- night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.

### This will lead to . . . Year 6 – Light

- 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