

## Science: Earth and Space

**Definition:** Earth and space science explores the interconnections between the land, ocean, atmosphere, and life of our planet. These include the cycles of water, carbon, rock, and other materials that continuously shape, influence, and sustain Earth and its inhabitants.

**Physics definition:** Physics is the study of nature and how matter and energy behave.

**POS:**

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
- Describe the movement of the Moon relative to the Earth.
- Describe the Sun, Earth and Moon as approximately spherical bodies.
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.

**Prior learning Reception/ Year 1:**

- Explore the natural world around them. (Reception - Earth and space)
- Describe what they see, hear and feel whilst outside. (Reception - Earth and space)
- Changes across the four seasons. (Y1 - Seasonal changes)
- Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)

Links to other science topics:  
Seasonal Change  
Light

**Disciplinary concepts:**

**Structure** – how is our galaxy arranged?

**Process** – how can you explain day and night?

**Common misconceptions:**

Children may believe that the Earth is flat and stationary. They will have observed the Moon and Sun appearing to move across the sky, and will know that the Sun rises and sets, giving us day and night. The children might think that the Sun is a planet and that it rotates around the Earth.

Some children may think that stars 'disappear' or 'go away' during the day. Children may believe that the Moon appears only at night. They may think that night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.

**Core Knowledge:**

The Sun is a star. It is at the centre of our solar system.

There are 8 planets (can name them). These travel around the Sun in fixed orbits.

Earth takes 365  $\frac{1}{4}$  days to complete its orbit around the sun.

The earth rotates (spins) on its axis. As earth rotates, half faces the Sun (here it is day) and half is facing away from the Sun (night). As the earth rotates the Sun appears to move across the sky.

The moon orbits the earth. It takes about 28 days to complete its orbit.

The Sun, earth and moon are approximately spherical.

**Wider Knowledge:**

The Universe is more than 13.8 billion years old. Astronomers believe that before this there was nothing and the Universe was born with a bang, this is called the Big Bang Theory.

There are many observatories in the world. Stonehenge in Wiltshire, UK (believed to have been built around 5,000 years ago), El Caracol which is a Mayan observatory at Chichen Itza, Mexico (built around 600 AD) and the Kielder Observatory in Northumberland, UK (built 2008). El Caracol and Kielder are both known to be observatories, whereas Stonehenge is only believed to be an observatory. An observatory is a building from which astronomical objects (objects in our universe) can be observed. [Awesome observing - Explorify](#) International Space Station [International Space Station | NASA](#)

**Working scientifically:**

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

**End Goals:**

To describe the movement of the Earth relative to the Sun and explain how this causes night and day and the apparent movement of the sun across the sky.

To describe the movement of the Moon relative to the Earth.

To explain that the Sun, Earth and Moon are approximately spherical.

**CPD:** Reach out CPD Science Association / STEM website / Explorify

**Enrichment:** Jodrell Bank