



Earth and Space– Year 5

<p>Summary/key areas to cover in unit</p>	<p>Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a ‘dwarf planet’ in 2006). They should understand that a Moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.</p> <p>The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (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.</p> <p>Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus</p>		
<p>Objectives</p>	<ul style="list-style-type: none"> • 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. 	<p>Vocabulary:</p>	<p>sun – a huge star that Earth and other planets in our solar system orbit</p> <p>star – a giant ball of gas held together to its own gravity</p> <p>moon – a natural satellite which orbits Earth or other planets</p> <p>sphere - a round 3D shape in the shape of a ball.</p> <p>spherical bodies – astronomical objects shaped like spheres.</p> <p>satellite – any object or body in space that orbits something else, for example the moon is a satellite of Earth.</p> <p>orbit - to move in a regular repeating curved path around another object.</p> <p>rotate – to spin e.g. the earth spins on its own axis.</p> <p>axis - an imaginary line that a body rotates around e.g. the Earth’s axis (imaginary line) runs from the North Pole to the South Pole.</p>
<p>Prior learning/Understanding</p>	<ul style="list-style-type: none"> • Observe changes across the four seasons. (Y1 - Seasonal changes) • Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes) 	<p>Working Scientifically Skills coverage:</p>	<ul style="list-style-type: none"> • They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

<p>Future Learning/understanding</p>	<ul style="list-style-type: none"> • Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10 \text{ N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). (KS3) • Our Sun as a star, other stars in our galaxy, other galaxies. (KS3) • The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3) • The light year as a unit of astronomical distance. (KS3) 		<ul style="list-style-type: none"> • identifying scientific evidence that has been used to support or refute ideas or arguments • recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> • Research and discuss the development of theories around space. • Comparing the time of day at different places on the Earth through internet links and direct communication • Creating simple models of the solar system • Constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day • Finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.
<p>Suggested activities /STEM Lab Opportunities</p>	<ul style="list-style-type: none"> • Use secondary sources to help create a model e.g. role play or using balls to show the movement of the Earth around the Sun and the Moon around the Earth. • Use secondary sources to help make a model to show why day and night occur. • Make first-hand observations of how shadows caused by the Sun change through the day. • Make a sundial. • Research time zones. • Consider the views of scientists in the past and evidence used to deduce shapes and movements of the Earth, Moon and planets before space travel. <p>For further ideas and guidance follow the hyperlink below stem.org.uk/resources/community/collection/12347/year-5-earth-and-space</p>	<p>Assessment tasks</p>	<p>Ongoing teacher assessment/judgement.</p> <p>Pupil's may be able to:</p> <ul style="list-style-type: none"> • Create a voice over for a video clip or animation. • Using diagrams, show the movement of the Earth and Moon. • Explain the movement of the Earth and Moon. • Using diagrams, show how the rotation of the Earth and how this causes day and night. • Explain what causes day and night.

Key Local Links:

- Cumbria has many dark skies areas and stargazing spots to give children a chance to see the moon and different star constellations. There are different dark skies events posted on the following links.
visitlakedistrict.com/explore/dark-sky-cumbria
friendsofthelakedistrict.org.uk/pages/events/site/dark-skies-subsite/category/dark-skies-events
- Planetarium workshops offered in the North West
findschoolworkshops.co.uk/Mobile-Planetarium/Cosmos-Planetarium-l466.html

Common Misconceptions:

The 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.