




## Earth and Space – Year 5

<b>Essential Knowledge (End Points):</b>	<ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</li> <li>Describe the movement of the Moon relative to the Earth.</li> <li>Describe the Sun, Earth and Moon as approximately spherical bodies.</li> <li>Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the Sun across the sky.</li> <li>Research the life of the first woman in space – Helen Sharman.</li> </ul>		
<b>Summary</b>	<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>	<b>Vocabulary:</b>	<p><b>Sun</b> – a huge star that Earth and other planets in our solar system orbit</p> <p><b>Star</b> – a giant ball of gas held together to its own gravity</p> <p><b>Moon</b> – a natural satellite which orbits Earth or other planets</p> <p><b>Spherical bodies</b> – astronomical objects shaped like spheres.</p> <p><b>Satellite</b> – any object or body in space that orbits something else, for example the moon is a satellite of Earth.</p> <p><b>Orbit</b> - to move in a regular repeating curved path around another object.</p> <p><b>Rotate</b> – to spin e.g. the earth spins on its own axis.</p> <p><b>Axis</b> - 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><b>Solar system</b> - the collection of planets, and their moons, in orbit round the sun.</p>
<b>Prior learning/Understanding</b>	<ul style="list-style-type: none"> <li>Observe changes across the four seasons. (Y1 - Seasonal changes)</li> </ul>	<b>Working Scientifically Skills coverage:</b>	<ul style="list-style-type: none"> <li>They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk</li> </ul>

<p><b>Future Learning/understanding</b></p>	<ul style="list-style-type: none"> <li>• Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)</li> <li>• Gravity force, weight = mass x gravitational field strength (g), on Earth <math>g=10 \text{ N/kg}</math>, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). (KS3)</li> <li>• Our Sun as a star, other stars in our galaxy, other galaxies. (KS3)</li> <li>• The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3)</li> <li>• The light year as a unit of astronomical distance. (KS3)</li> </ul>		<p>about how scientific ideas have developed over time.</p> <ul style="list-style-type: none"> <li>• identifying scientific evidence that has been used to support or refute ideas or arguments</li> <li>• recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.</li> </ul> <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>• Research and discuss the development of theories around space.</li> <li>• Comparing the time of day at different places on the Earth through internet links and direct communication</li> <li>• Creating simple models of the solar system</li> <li>• Constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day</li> <li>• Finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.</li> </ul>
<p><b>Suggested activities /STEM Lab Opportunities</b></p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Use secondary sources to help make a model to show why day and night occur.</li> <li>• Make first-hand observations of how shadows caused by the Sun change through the day.</li> <li>• Make a sundial.</li> <li>• Research time zones.</li> <li>• 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.</li> </ul>	<p><b>Assessment tasks</b></p>	<p>Ongoing teacher assessment/judgement.</p> <p>Pupil's may be able to:</p> <ul style="list-style-type: none"> <li>• Using diagrams, show the movement of the Earth and Moon.</li> <li>• Explain the movement of the Earth and Moon.</li> <li>• Using diagrams, show how the rotation of the Earth and how this causes day and night.</li> <li>• Explain what causes day and night.</li> </ul>
<p><b>Key Local Links:</b></p>	<ul style="list-style-type: none"> <li>• Cumbria has many dark skies areas and stargazing spots to give children a chance to see the moon and</li> </ul>	<p><b>Common Misconceptions:</b></p>	<p>The children may think:</p> <ul style="list-style-type: none"> <li>• The Earth is flat.</li> <li>• The Sun is a planet.</li> </ul>

	<p>different star constellations. There are different dark skies events posted on the following links.</p> <p><a href="http://visitlakedistrict.com/explore/dark-sky-cumbria">visitlakedistrict.com/explore/dark-sky-cumbria</a></p> <p><a href="http://friendsofthelakedistrict.org.uk/pages/events/site/dark-skies-subsite/category/dark-skies-events">friendsofthelakedistrict.org.uk/pages/events/site/dark-skies-subsite/category/dark-skies-events</a></p> <ul style="list-style-type: none"> <li>Planetarium workshops offered in the North West</li> </ul> <p><a href="http://findschoolworkshops.co.uk/Mobile-Planetarium/Cosmos-Planetarium-l466.html">findschoolworkshops.co.uk/Mobile-Planetarium/Cosmos-Planetarium-l466.html</a></p>		<ul style="list-style-type: none"> <li>The Sun rotates around the Earth.</li> <li>The Sun moves across the sky during the day.</li> <li>The Sun rises in the morning and sets in the evening.</li> <li>The Moon appears only at night.</li> <li>Night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.</li> </ul>
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	Component Statements	
<p><b>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</b></p>	<p>Children will:</p> <ul style="list-style-type: none"> <li>know and name the 8 planets in the solar system (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune). Pluto is a dwarf planet.</li> <li>know that our Sun is a star in the center of our solar system and that there are other stars in our galaxy and other galaxies.</li> </ul>	
<p><b>Describe the movement of the moon relative to the Earth.</b></p>	<p>Children will:</p> <ul style="list-style-type: none"> <li>know that the moon orbits the Earth.</li> <li>know and explain the phases of the moon.</li> <li>be able to explain that the Moon's gravity causes high and low tides.</li> <li>know that the Moon orbits the Earth anticlockwise and takes approximately 28 days.</li> </ul>	
<p><b>Describe the Sun, Earth and Moon as approximately spherical bodies.</b></p>	<p>Children will:</p> <ul style="list-style-type: none"> <li>be able to describe the sun, Earth and Moon as spherical in shape.</li> <li>know that Earth orbits the sun.</li> <li>know that Moon orbits the Earth.</li> </ul>	
<p><b>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.</b></p>	<p>Children will:</p> <ul style="list-style-type: none"> <li>be able to explain why day and night occur.</li> <li>understand that Earth rotates on its axis anti-clockwise and makes a complete rotation over 24 hours (a day).</li> <li>know that different parts of the Earth experience daylight at different times - this means that it is morning, afternoon and night in different places. This is also the reason why we have time zones.</li> </ul>	

**Research the life of the first woman in space – Helen Sharman.**

Children will:

- be able to explain why Helen Sharman is a significant individual.