

| | | |
|---------------------------------|--|---------------------------------|
| Year 5 – Earth and space | Main Outcomes: <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. | Focus: Science – physics |
|---------------------------------|--|---------------------------------|

What should I already know?
 (From year 1, seasonal changes)

- The Earth spins around once every 24 hours.
- When a side of the Earth is facing **the Sun**, it is day on that side; it is night on the side that is facing away from **the Sun**.
- Night and day are affected by the seasons.
- The Earth is tilted at an angle.
- It takes the Earth one year to **orbit the Sun**.
- When we are tilted towards **the Sun**, it is summer: we have long days and short nights.
- When we are tilted away from **the Sun**, it is winter: we have short days and long nights.

What I will do

I will have weekly or blocked science lessons. In lessons, I will be taught a skill and I will gain knowledge and understanding through the process of scientific enquiry (observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources).

Possible lines of enquiry

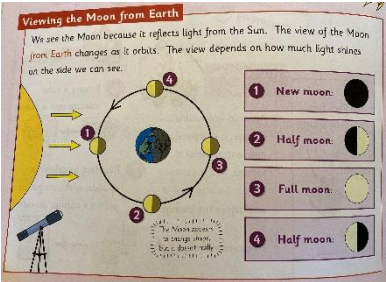
- Create a model of the Sun and Earth that enables pupils to explain day and night.
- Create a model of our Solar System that enables pupils to explain that the Sun is a star at the centre and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006).
- Create a model that enables pupils to explain that moons are celestial bodies that orbit a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones).
- Create a model that enables pupils to explain the phases of the Moon.

Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.

Resources

Hamilton Science planning: earth and space
<https://www.hamilton-trust.org.uk/science/year-5-science/earth-and-space-space-presenters/> (all planning also saved on SharePoint).

| Vocabulary | Meaning |
|------------------------|--|
| accuracy | the closeness of the measured value to a standard or true value |
| astronomical clock | a clock with mechanism and dials for indicating various astronomical phenomena (such as phases of the Moon , movements of the planets) |
| axis | an imaginary line an object turns around |
| celestial body | any natural object outside of the Earth's atmosphere, e.g. the Moon , Sun , and the other planets of our solar system |
| eclipse | happens when one object in space blocks another from view |
| geocentric model | where the Earth is at the centre of the universe, and the planets , the Sun and the Moon , and the stars circles around it |
| gnomon | the stationary arm that projects the shadow on a sundial |
| gravity | a force that pulls everything down toward the centre of the Earth |
| Greenwich Meantime | (GMT) the local clock time at Greenwich |
| heliocentric model | where the Sun is at the centre of the universe, and the planets revolve around it |
| line graph | plotted on a graph as a series of points joined with straight lines, it displays information which changes over time |
| mass | the amount of matter or substance that makes up an object |
| (the) Moon | a large natural object that orbits Earth |
| orbit | the path of an object around a particular point in space |
| orrery | a mechanical model of the solar system that shows the relative positions and motions of the planets and moons according to the heliocentric (Sun-centred) model |
| planets | large natural objects that orbit stars |
| precision | how precise or exact something is |
| reflection | when light hits a surface and bounces off |
| rotate/rotation | spins about its centre |
| satellite | a small object that orbits a larger object in space |
| scatter graph | a diagram which compares two sets of data |
| shadow clock / sundial | made up of two parts: a flat circular plate and a gnomon , which casts a shadow on the plate. This shadow shows the time |
| solar system | the Sun and everything that orbits it |
| sphere/ spherical | round, or more or less round, in three dimensions |
| (the) Sun | the star at the centre of the solar system |
| support/refute | to prove right (support) or wrong (refute) by argument or evidence |
| telescope | an instrument that allows people to see distant objects |
| tide | the rise and fall of the levels of the ocean |
| time-zone | time zones give specific areas on the Earth a time of day that is earlier or later than the neighbouring time zones |
| variable | any one of the elements of the test which could be changed |

| Knowledge to understand | | Skills to learn |
|---|--|---|
| <p>The Sun is at the centre of our Solar System.</p> | <p>The Sun is a star. The planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune) move around the Sun in roughly circular orbits. All eight planets, the Sun and the Moon are roughly spherical (round). The Moon orbits the Earth once every 28 days. Earth isn't the only planet with a moon – some other planets, like Jupiter, have moons too.</p> | <ul style="list-style-type: none"> ➤ 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 ➤ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and 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 <p>Cross-curricular (maths)</p> <ul style="list-style-type: none"> ➤ Use all four operations to solve problems involving measure including scaling ➤ Solve problems involving \times and \div, including scaling by simple fractions and problems involving simple ratios. |
| <p>We see the Moon because it reflects light from the Sun.</p> | <p>The view of the Moon from Earth changes as it orbits. The view depends on how much light shines on the side we can see.</p>  | |
| <p>Night and day are caused by the Earth rotating (spinning on its axis).</p> | <p>1 full rotation = 24 hours = 1 day. For the side facing the Sun, it is day time. For the side facing away from the Sun, it is night time. The Earth's rotation causes the Sun to appear to move across the sky. The Sun rises in the East and sets in the West.</p> | |
| <p>The Sun is a very strong light source.</p> | <p>You should NEVER look directly at the Sun, even if you're wearing sunglasses.</p> | |
| Equipment to become familiar with | | <p>Orrery</p> <p>Rulers/measuring tapes</p> <p>Compass (for directions)</p> |

| Evidence of Learning | How will I know what I've learnt? |
|---|---|
| <p>Science books</p> <p>Photos</p> <p>Videos</p> <p>Pupil conferencing</p> <p>Teaching and learning observations</p> <p>Learning walks</p> <p>Data analysis</p> | <p>See KS2 teacher assessment exemplification for science</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/763065/2018_key_stage_2_teacher_assessment_exemplification_science.pdf</p> <p>See also Hamilton Science_Assessment_Y5 (saved in planning folder on Sharepoint).</p> <p>KS2 quizzes:</p> <p>https://gcequiz.com/quiz/ks2-science-quizzes</p> <p>https://churchfieldsjunior.com/test-your-skills-science/</p> |