

**Year: 5 Term: 1b Cornerstones Unit: Earth and Space**

**National Curriculum Progression**

Y1	Y2	Y3	Y4	Y5	Y6
<p><b>Seasonal Change</b></p> <p>i. observe changes across the four seasons</p> <p>ii. observe and describe weather associated with the seasons and how day length varies.</p>		<p><b>Light</b></p> <p>i. recognise that they need light in order to see things and that dark is the absence of light</p> <p>ii. notice that light is reflected from surfaces</p> <p>iii. recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>iv. recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>v. find patterns in the way that the size of shadows change.</p> <p><b>Forces and Magnets</b></p> <p>i. compare how things move on different surfaces</p> <p>ii. notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>iii. observe how magnets attract or repel each other and attract some materials and not others ♣ compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials</p> <p>iv. describe magnets as having two poles</p> <p>v. predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p><b>Sound</b></p> <p>i. identify how sounds are made, associating some of them with something vibrating</p> <p>ii. recognise that vibrations from sounds travel through a medium to the ear</p> <p>iii. find patterns between the pitch of a sound and features of the object that produced it</p> <p>iv. find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>v. recognise that sounds get fainter as the distance from the sound source increases.</p> <p><b>Electricity</b></p> <p>i. identify common appliances that run on electricity</p> <p>ii. construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>iii. identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>iv. recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>v. recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p><b>Earth and Space</b></p> <p>i. describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>ii. describe the movement of the Moon relative to the Earth</p> <p>iii. describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>iv. use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p><b>Forces</b></p> <p>i. explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>ii. identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>iii. recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	<p><b>Light</b></p> <p>i. recognise that light appears to travel in straight lines</p> <p>ii. use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p> <p>iii. explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <p>iv. use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. <b>Electricity</b></p> <p>i. associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>ii. compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>iii. use recognised symbols when representing a simple circuit in a diagram.</p>

**Scientific Enquiry Skills**

Asking Questions	Investigating	Gathering and Recording Data	Presenting and Analysing Findings
<p>♣ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p>	<p>♣ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p>	<p>♣ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p>	<p>♣ using test results to make predictions to set up further comparative and fair tests</p> <p>♣ 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</p> <p>♣ identifying scientific evidence that has been used to support or refute ideas or arguments.</p>

Key Vocabulary – Unit Specific		Key Vocabulary – Scientific Enquiry
<p><b>Solar System – Sun, orbits, planets, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.</b></p> <p><b>Earth – orbits, Sun, year (365.25 days), length of time, complete, full orbit</b></p> <p><b>Moon – orbits, Earth, complete, full orbit, month (27.3 days)</b></p> <p><b>shape - Sun, Earth, Moon, planets, solar system, spherical</b></p> <p><b>Earth – spins, axis, day (24 hours), complete, full spin, rotating, rotates, face the sun, daytime, facing away, shadow, night time</b></p>		<p><b>questions, explain, scientific enquiry</b></p> <p><b>equipment - measuring tape, hand lens, trundle wheel, ruler, data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres). A force meter can be used to measure an object's mass in grams (g) or kilograms (kg) and its weight in newtons (N), accurate measurements</b></p> <p><b>observe, accurate observations, compare, group, classify, feature, similarities, differences, make simple connections, measure, systematic, regular intervals</b></p> <p><b>tests, instructions, method, prediction, investigation, comparative test, fair test, variable, constant results, information, investigate, investigation, noticing patterns and relationships, conclusion, evidence record, data, table, charts, Venn diagram, labelled diagrams, bar and line graphs, timeline, key, models, explain</b></p>
	Conceptual Learning Goals - Core Knowledge	Procedural Learning Goals - Skills
Substantive Knowledge	<p>a. Know that the Solar System is made up of the Sun and everything that orbits around it. There are eight planets in our Solar System: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.</p> <p>b. Know that the Earth orbits around the Sun and a year (365.25 days) is the length of time it takes for Earth to complete a full orbit.</p> <p>c. Know that the Moon orbits Earth, completing a full orbit every month (27.3 days).</p> <p>d. Know that the Sun, Earth, Moon and the planets in our solar system are roughly spherical.</p> <p>e. Know that as Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin. During the day, the Sun appears to move through the sky. However, this is due to the Earth rotating and not the Sun moving. As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time.</p>	<p>a. Know how to describe the Solar System in terms of the sun and the other eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.</p> <p>b. Know how to model the Earth orbiting around the Sun and the time it takes to complete one orbit.</p> <p>c. Know how to model the Moon orbiting Earth, and the time it takes to complete one orbit.</p> <p>d. Know how to describe the shape of the Sun, Earth, Moon and the planets in our solar system.</p> <p>e. Know how to explain why day and night occurs</p>
Disciplinary Knowledge	<p>f. Know that questions can help us find out about the world and can be answered using a range of scientific enquiries.</p> <p>g. Know that specialised equipment is used to take measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres). A force meter can be used to measure an object's mass in grams (g) or kilograms (kg) and its weight in newtons (N).</p> <p>h. Know that a method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.</p> <p>i. Know that an observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time.</p> <p>j. Know that the results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.</p> <p>k. Know that data can be recorded and displayed in different ways, including tables, bar and line graphs, classification keys and labelled diagrams.</p>	<p>a. Know how to ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them.</p> <p>b. Know how to take increasingly accurate measurements in standard units, using a range of chosen equipment.</p> <p>c. Know how to plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding.</p> <p>d. Within a group, know how to decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect.</p> <p>e. Know how to use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions</p> <p>f. Know how to gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models).</p>

**Scientific Enquiries:**

The Solar System; Scientists of the past who discovered how the Solar System works; The Earth, Sun and Moon; Planets and stars are spherical; Daytime and night time; Sundials; Day length and the seasons; Times of the day around the world; The phases of the Moon; Lunar and solar eclipses; Working scientifically – Identifying and classifying, Research, Changes over time, Pattern seeking

Observing changes Over a Period of Time	Noticing Patterns	Grouping and Classifying Things	Carrying out comparative and fair tests	Finding things out using a wide range of secondary sources of information.
The phases of the moon	Sundials Times of the phases of the moon around the world			The Solar System 'What would you like to know about how scientists found out how the Solar System works?' Choose one of the breadth and depth lessons: <ul style="list-style-type: none"> <li>○ <i>Daytime and nighttime</i></li> <li>○ <i>Day length and seasons</i></li> <li>○ <i>Lunar and solar eclipses</i></li> </ul> The seven other planets

**Assessment Criteria:****Disciplinary Knowledge and Skills**

The pupil can, using appropriate scientific language from the national curriculum:

- describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources
- ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources)
- use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate
- record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways
- raise further questions that could be investigated, based on their data and observations.

**Substantiative Knowledge and Skills**

The pupil can:

- describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night

**Resources**