

Science Progression



Intent
Children will develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. They will develop an understanding of the nature, processes and methods of science through varied opportunities for working scientifically that help them to answer scientific questions about the world around them. Children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Implementation
Across school, we use the 'Snap Science' scheme to plan and deliver our science lessons. Throughout the school, teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching.

Impact
Pupils are achieving well in science, as shown in our science data. In autumn term data, 95% of children in KS1 achieved AT, 98% of children in LKS2 and 97% of children in UKS2 achieved AT. Data also shows that SEND children are achieving well in science. Pupil premium children have been identified as a group of children who need more support in science. Use of new formative assessments will allow us to closely monitor pupil premium children's progress. Pupil interviews indicated that children could remember knowledge from current science topics.

| Level expected at the end of EYFS | Key Stage One National Curriculum Expectations | Key Stage Two National Curriculum Expectations |
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| <p>During the foundation stage, pupils should be taught to use the following practical scientific methods, processes and skills:</p> <ul style="list-style-type: none"> • making observations • noticing similarities and differences • noticing changes • making links between their experience and what has been read in class. • Asking simple questions • Using their observations and ideas to suggest answers to simple questions. | <p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions | <p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings. <p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</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 • 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 • |

| | EY | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
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| Questioning | Know that a question is a phrase/sentence which asks for information. | Know that questions can be asked to gather information to support understanding. | Know that specifically there are scientific questions and that there is more than one way of finding the answer. | Know that questions can be asked and answered by carrying out a scientific enquiry. | Know that relevant scientific questions need to be asked and answered through different types of scientific enquiries. | Know that questions can be or might need to be refined through the scientific process. | Know that precision is achieved through refinement of both questioning and of control of the variables in a scientific enquiry. |
| Observing and Measuring | Know that looking carefully at something provides more information about it. | Know that there are different ways to observe things closely. | Know that an appropriate choice of simple equipment will make observations more effective in the gathering of information. | Know that careful observations can form part of scientific enquiry Know that data can be collected from observations and measurements | Know that the quality of systematic observations in scientific enquiry is affected by how accurately equipment is used to gather data. | Know that specialised equipment can be used to observe and measure more accurately. Know that repeating an observation or measurement may provide more accurate information. | Know that the level of accuracy and precision will determine the success of scientific enquiry. |
| Testing | Know that the information needed to answer a question, sometimes needs to be checked to make sure it is correct. Know that a test is a way of used to check something. | Know that a test is a procedure which can be used to check the accuracy of the information used to answer questions. | Know that there are different ways to perform a test including the use of simple equipment. | Know that the process used to carry out a scientific enquiry must be fair. | Know that if the procedure used in the scientific enquiry is not fair then the information gathered is unreliable. | Know that the outcome of a fair test can inform and shape further scientific enquiries. | Know that the outcomes from fair tests supports factual understanding of a scientific enquiry which may differ from opinion. |
| Identifying (& Classifying) | Know that it is possible to recognise something by its features. | Know that by comparing common features, it is possible to group and sort objects, materials or living things. | Know that sorting and grouping by features and characteristics can be refined to give more accurate and detailed identification (for example, tree/oak tree/deciduous) | Know that information collected during a simple scientific enquiry can be used to inform identification and classification. | Know that accurate identification and classification can be used to answer questions in a simple scientific enquiry. | Know that identification and classification can involve the organisation of a substantial amount of information and there are agreed methods for doing this. (e.g. key, graphs) | Know that the success of more complex scientific enquiries requires appropriate selection of the most effective method of classifying information. |
| Hypothesising | Know that ideas can be put forward for thinking and talking about. | Know that ideas can be used to predict possible outcomes to a scientific enquiry. | Know that a prediction can be informed by prior knowledge and experience. | Know that a hypothesis is a starting point for further scientific enquiry. | Know that a hypothesis can be refined as a result of scientific enquiry and used to inform the next stage of the process. | Know that knowledge gained from previous scientific enquiries can be used to inform a more accurate hypothesis at the outset of a new enquiry. | Know that an efficient and effective scientific enquiry should be based on an informed hypothesis. |
| Interpreting and Recording Data | Know that information can be collected and shared with others. | Know that there are many ways to collect and record information and that this can be used by others. | Know that recorded data can be used to find answers to questions. | Know that recorded data is an important part of a scientific enquiry as it can be used draw conclusions. | Know that inaccurately recorded data can mislead and lead to incorrect conclusions. | Know that filtering data is an important step when drawing conclusions so that only the most relevant information is used. | Know that accurate data can be a powerful tool when supporting or refuting scientific ideas/arguments. |

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| <p>Biology</p> <p>Life processes</p> | <p>Know that animals need food to survive. Know that plants need water.</p> | <p>Know that different animals need different types of food. <i>(Looking at animals topic)</i></p> <p>Know that plants need water and light. <i>(Plant detectives topic)</i></p> | <p>Know that some things are living, some are dead and some have never been alive. <i>(What's in your habitat topic)</i></p> <p>Know that plants need water, light and warmth. <i>(Apprentice Gardener topic)</i></p> <p>Know that animals need water, food and air, and healthy animals need exercise, a balanced diet and hygiene. <i>(Take care and growing up topics)</i></p> | <p>Know that to stay healthy, plants need light, water, nutrients and room to grow. <i>(Our Changing World topic)</i></p> <p>Know that animals cannot make their own food. <i>(Amazing Bodies topic)</i></p> | | <p>Know that plants and animals need to reproduce. <i>(Reproduction in plants and animals topic)</i></p> | <p>Know that some substances and lifestyle choices can have a negative impact on health. <i>(Body Health topic)</i></p> |
| <p>Structure and function</p> | <p>Know that plants have different parts and can name several parts.</p> <p>Know that humans have different body parts and can name some body parts.</p> | <p>Know that flowering plants have different parts – roots, stems, leaves, flowers, fruit, seeds <i>(Plant detectives topic)</i></p> <p>Know that animals, including humans, have different body parts ... and these have special functions to help them survive (including senses). <i>(Using our senses topic)</i></p> | | <p>Know that different parts of flowering plants have different functions. Know that many animals, including humans, have skeletons and muscles for support, protection and movement. <i>(Amazing Bodies topic)</i></p> | <p>Know that animals and humans have teeth to help them eat. Know that food is broken down further in the stomach and intestine and absorbed into the blood stream with water. <i>(Where does all that food go topic).</i></p> | | <p>Know that oxygen is taken into the blood in the lungs; the blood is pumped by the heart to take oxygen and nutrients to the muscles. <i>(Body pump topic)</i></p> |
| <p>Classification</p> | <p>Know that animals can be grouped by their habitat e.g. arctic, jungle.</p> | <p>Know that plants are grouped into common wild and garden plants, deciduous and evergreen trees. <i>(Plant detectives topic)</i></p> <p>Know that animals are grouped into fish, amphibians, reptiles, birds <i>(Looking at animals topic)</i></p> | <p>Know that animals and plants can be identified and grouped. This is linked to habitat. <i>(What's in your habitat topic)</i></p> | | <p>Know that plants and animals can be grouped using a wider range of characteristics. Know that keys are used for the identification of animals and plants. <i>(Who am I topic)</i></p> | | <p>Know that a wider range of living things including micro-organism can be classified. <i>(Nature Library topic)</i></p> |
| <p>Life cycles</p> | <p>Know that humans change from baby-child-teenager-adult-elderly,</p> <p>ANIMALS- baby names and caterpillar</p> | | <p>Know that seeds and bulbs grow into plants. <i>(Apprentice Gardener topic)</i></p> <p>Know that animals, including humans, reproduce offspring which grow into adults. <i>(Growing up topic)</i></p> | <p>Know that plants make seeds to produce more plants. <i>(How does your Garden grow topic and Our Changing World topic)</i></p> | | <p>Know that plants can reproduce asexually. Know that life cycles differ for different species. <i>(Circle of life topic)</i></p> <p>Know that human development has different stages between birth and death. <i>(Reproduction in plants and animals)</i></p> | <p>Know that living things produce offspring of the same kind, but not identical. <i>(Our Changing World topic)</i></p> |
| <p>Interdependence</p> | <p>Know that animals need food to survive.</p> | | <p>Know that different plants and animals live in different places to which they are suited. Know that animals get their food from plants and other animals and in turn they are consumed by other animals.</p> | | <p>Know that nutrients made by plants move to primary consumers and then to secondary consumers through food chains. <i>(Where does all that food go topic)</i></p> | | <p>Know that plants and animals are adapted to suit their environment. Know that environmental change and human impact affects different habitats differently. Know that living things have changed over time and that adaptation may lead to evolution. <i>(Everything Changes topic and Our Changing World topic)</i></p> |

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| | | | <i>(What's in your habitat topic)</i> | | | | |
| Chemistry Materials- describing and using materials | Know that objects are made from different materials. | Know that there are different materials and they are used to make different objects. Know that different materials have different properties and materials can be sorted into groups according to their observable properties. <i>(Everyday Materials topic)</i> | Know that different materials are suitable for different uses. <i>(Good choices topic)</i> | Know that different materials, including rocks, have different properties. <i>(Rock detectives topic)</i> | Know that materials can be solids, liquids or gases. <i>(In a state topic)</i> | Know that different properties make materials suitable for different uses. Know that materials can be sorted into groups according to properties including hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets. <i>(Get sorted topic)</i> | |
| Changing materials | Know that some materials can be changed by being heated e.g. melting. | | Know that the shape of some solid materials can be changed by a contact force acting on them. <i>(Materials- shaping up topic)</i> | | Know that some materials change state when heated or cooled. <i>(In a state topic)</i> | Know that some materials will dissolve in a liquid and that changes including baking, burning and the reaction of certain chemicals, result in new materials. Know that changes that result in new materials are not usually reversible. Know that dissolving, mixing and changes of state are reversible changes <i>(All change topic)</i> | |
| Mixing and separating materials | Know that some materials can be mixed together. | | | Know that soils are a mixture of rocks and organic matter Know that fossils are formed when trapped within rock. <i>(Rock detectives topic)</i> | | Know that mixtures can be separated by filtering, sieving and evaporating <i>(Marvellous mixtures topic)</i> | |
| Physics Light | Know that torches can be used to create light. | Know that our eyes are the body part we use to see things. <i>(Using our senses topic)</i> | | Know that we need light to see things, and that when light hits a materials, some of it is reflected off the materials. Know that some materials block the light and a shadow is formed and that the size of shadows change according to the size and shape of the object and distance from the light source. Know that darkness is the absence of light. <i>(Can you see me topic)</i> | | | Know that light travels in straight lines and that we see light from a source reflected off an object into our eyes. Know that shadows have the same shape as the object that casts them <i>(Light up your world topic)</i> |
| Sound | Know that musical instruments create sound. | Know that our ears are the body part we use to hear things. <i>(Using our senses topic)</i> | | | Know that sounds are made when something vibrates. Know that sounds get fainter the further they are from the source. Know that the volume and pitch of a sound can be changed. <i>(Good vibrations topic)</i> | | |
| Electricity | | | | | Know that electrical appliances need a source of electricity to work. Know that a complete circuit is needed for an electric current to flow and know that a circuit is made up of different components Know that some materials are better conductors than others <i>(Switched on topic)</i> | | Know that there are recognised symbols for circuits and their components. Know that an increase in voltage will cause an increase in current. Know that some components can resist the current more than others <i>(Danger, low voltage topic)</i> |

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| <p>Forces</p> | <p>Know that some toys can be pushed or pulled.</p> | | <p>Know that some objects can be pushed or pulled. <i>(Materials- shaping up)</i></p> | <p>Know that pushing and /or pulling can make things start moving, stop, go faster or slower. Know that some forces need contact between two objects and that some forces act between objects although they are not in contact. Know that friction is a force that occurs when one object moves over another one that opposes motion. Know that magnets can act at a distance and magnets exert attractive and repulsive forces on each other. Know that some materials are magnetic and some are not. <i>(The power of forces topic)</i></p> | | <p>Know that drag forces resist movement. Know that the force of gravity caused by the Earth pulls objects towards its centre. Know that some mechanisms allow a smaller force to have a greater effect. <i>(Feel the force topic)</i></p> | |
| <p>Earth and Space</p> | <p>Know that we have different seasons</p> | <p>Know that the temperature and day length changes over the year. <i>(Our Changing World- sensing seasons topic)</i></p> | | | | <p>Know that the Earth, Sun and Moon are approximately spherical. Know that the Earth is one of eight planets that orbit the Sun and the Earth orbits the Sun once every year. Know that the Earth rotates on its own axis once every 24 hours and the moon orbits the Earth and looks different at different times of the month. Know that it is due to the rotation of the earth that we experience day and night. <i>(The Earth and Beyond topic)</i></p> | |