

**The national curriculum for science aims to ensure that all pupils:**

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

**Key Stage 1**

- The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.
- They should be encouraged to be curious and ask questions about what they notice.
- They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.
- They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.
- Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.
- 'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study.
- Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
- should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

**Lower Key Stage 2**

- The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them.
- They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions.
- They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.
- They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.
- 'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study.
- Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
- Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

**Upper Key Stage 2**

- The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas.
- They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.
- At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.
- They should also begin to recognise that scientific ideas change and develop over time.
- They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including 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 of information.
- Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
- 'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study.
- Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
- Pupils should read, spell and pronounce scientific vocabulary correctly.

	Nursery Scientist	Reception Scientist	Year 1 Scientist	Year 2 Scientist
Working	<p><b>(30 – 50 months)</b></p> <p><b>Children:</b></p> <ul style="list-style-type: none"> <li>Comment and asks questions about aspects of their familiar world such as the place where they live or the natural world. (All)</li> <li>Can talk about some of the things they have observed such as plants, animals, natural and found objects. (Love, Rainbow, Snow, Dog)</li> <li>Talk about why things happen and how things work. (Love, Chocolate, Rainbow, Snow, Dog)</li> <li>Develop an understanding of growth, decay and changes over time. (Love, Chocolate, Snow, Dog)</li> <li>Show care and concern for living things and the environment. (Love, Rainbow, Dog)</li> </ul>	<p><b>(40– 60 months)</b></p> <p><b>Children:</b></p> <ul style="list-style-type: none"> <li>Look closely at similarities, differences, patterns and change. (Squirrels, There yet, Zebras)</li> <li>Know about similarities and differences in relation to places, objects, materials and living things. (Squirrels, There yet, Zebras)</li> <li>Make observations of animals and plants and explain why some things occur, and talk about changes. (Squirrels, There yet, Zebras)</li> </ul>	<ul style="list-style-type: none"> <li>Know how to ask simple scientific questions.</li> <li>Know how to use simple equipment to make observations.</li> <li>Know how to carry out simple tests.</li> <li>Know how to identify and classify things.</li> <li>Know how to explain to others what I have found out.</li> <li>Know how to use simple data to answer questions.</li> </ul>	
Biology	<p><b>Adults:</b></p> <ul style="list-style-type: none"> <li>Use parents' knowledge to extend children's experiences of the world.</li> <li>Introduce vocabulary to enable children to talk about their observations and to ask questions.</li> <li>Develop children's understanding and vocabulary so they can confidently distinguish between different animals, dinosaurs, and insects.</li> </ul>	<p><b>Adults:</b></p> <ul style="list-style-type: none"> <li>Examine change over time, for example, growing plants, and change that may be reversed, e.g. melting ice.</li> <li>Encourage children to express opinions on natural and built environments and give opportunities for them to hear different points of view on the quality of the environment.</li> <li>Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name.</li> <li>Pose carefully framed open-ended questions, such as "How can we...?" or "What would happen if...?".</li> </ul>	<p><b>Plants</b></p> <ul style="list-style-type: none"> <li>Know and name a variety of common wild and garden plants. (EW, DP)</li> <li>Know and name the petals, stem, leaves and root of a plant. (EW)</li> <li>Know and name the roots, trunk, branches and leaves of a tree. (EW)</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>Know and name a variety of animals including fish, amphibians, reptiles, birds and mammals. (PCW, DP)</li> <li>Classify and know animals by what they eat (carnivore, herbivore and omnivore). (PCW, DP)</li> <li>Know how to sort animals into categories (including fish, amphibians, reptiles, birds and mammals). (PCW, DP)</li> <li>Know how to sort living and non-living things. (PCW)</li> <li>Know how to name the parts of the human body that I can see. (S)</li> <li>Know how to link the correct part of the human body to each sense. (S)</li> </ul>	<p><b>Plants</b></p> <ul style="list-style-type: none"> <li>Know how seeds and bulbs grow into plants. (SG)</li> <li>Know what plants need in order to grow and stay healthy (water, light &amp; suitable temperature). (SG)</li> </ul> <p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>Identify things that are living, dead and never lived. (BTT)</li> <li>Know how a specific habitat provides for the basic needs of things living there (plants and animals). (BTT)</li> <li>Identify and name plants and animals in a range of habitats. (BTT)</li> <li>Match living things to their habitat. (BTT)</li> <li>Know how animals find their food.</li> <li>Name some different sources of food for animals.</li> <li>Know and can explain a simple food chain.</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>Know the basic stages in a life cycle for animals, including humans.</li> <li>Know what animals and humans need to survive.</li> <li>Know why exercise, a balanced diet and good hygiene are important for humans. (GFL)</li> </ul>
Chemistry	<p><b>Environments:</b></p> <ul style="list-style-type: none"> <li>Use the local area for exploring both the built and the natural environment.</li> <li>Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs.</li> <li>Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of liquids and solids by involving children in melting chocolate or cooking eggs.</li> <li>Provide opportunities in the outdoor environment where children can explore force and gravity by moving different objects</li> </ul>	<p><b>Environments:</b></p> <ul style="list-style-type: none"> <li>Give opportunities to record findings by, e.g. drawing, writing, making a model or photographing.</li> <li>Give opportunities to design practical, attractive environments, for example, taking care of the flowerbeds or organising equipment outdoors.</li> </ul>	<p><b>Everyday materials</b></p> <ul style="list-style-type: none"> <li>Distinguish between an object and the material it is made from. (MZ)</li> <li>Know the materials that an object is made from.</li> <li>Know the difference between wood, plastic, glass, metal, water and rock. (MZ)</li> <li>Know about the properties of everyday materials. (MZ)</li> <li>Group objects based on the materials they are made from. (MZ)</li> </ul>	<p><b>Uses of everyday materials</b></p> <ul style="list-style-type: none"> <li>Identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. (SD, BTT, LA)</li> <li>Know why a material might or might not be used for a specific job. (SD, LA))</li> <li>Know how materials can be changed by squashing, bending, twisting and stretching. (LA)</li> </ul>
Physics	<ul style="list-style-type: none"> <li>Introduce vocabulary to enable children to talk about their observations and to ask questions, e.g. pushing, pulling, rolling, blowing .</li> </ul>		<p><b>Seasonal changes</b></p> <ul style="list-style-type: none"> <li>Observe and know about the changes in the seasons. (Ongoing)</li> <li>Name the seasons and know about the type of weather in each season. (Ongoing)</li> </ul>	<p><b>No content</b></p>
Themes	<ul style="list-style-type: none"> <li>Why do you love me so much? (LM)</li> <li>Where does snow go? (Sn)</li> <li>Why can't I have chocolate for breakfast? (CB)</li> <li>How many colours in a rainbow? (CR)</li> <li>Can I have a dog? (D)</li> </ul>	<ul style="list-style-type: none"> <li>Do you want to be friends? (F)</li> <li>Why do squirrels hide their nuts? (Sq)</li> <li>Are we there yet? (Y)</li> <li>Will you read me a story? (RS)</li> <li>Why do zebras have stripes? (ZS)</li> </ul>	<ul style="list-style-type: none"> <li>Superheroes (S)</li> <li>Enchanted Woodlands (EW)</li> <li>Paws, Claws and Whiskers (PCW)</li> <li>Dinosaur Planet (DP)</li> <li>Moon Zoom (MZ)</li> </ul>	<ul style="list-style-type: none"> <li>Street Detectives (SD)</li> <li>The Great Fire of London (GFL)</li> <li>Baddies, Towers and Tunnels (BTT)</li> <li>Land Ahoy (LA)</li> <li>Scented Garden (SG)</li> </ul>

	Year 3 Scientist	Year 4 Scientist	Year 5 Scientist	Year 6 Scientist
Working Scientifically	<ul style="list-style-type: none"> <li>• Know how to ask relevant scientific questions.</li> <li>• Know how to use observations and knowledge to answer scientific questions.</li> <li>• Know how to set up a simple enquiry to explore a scientific question.</li> <li>• Know how to set up a test to compare two things.</li> <li>• Know how to set up a fair test and explain why it fair.</li> <li>• Make careful and accurate observations, including the use of standard units.</li> <li>• Know how to use equipment, including thermometers and data loggers to make measurements.</li> <li>• Gather, record, classify and present data in different ways to answer scientific questions.</li> <li>• Know how to use diagrams, keys, bar charts and tables; using scientific language.</li> <li>• Know how to use findings to report in different ways, including oral and written explanations, presentation.</li> <li>• Know how to draw conclusions and suggest improvements.</li> <li>• Know how to make a prediction with a reason.</li> <li>• Know how to identify differences, similarities and changes related to an enquiry.</li> </ul>		<ul style="list-style-type: none"> <li>• Know how to plan different types of scientific enquiry.</li> <li>• Know how to control variables in an enquiry.</li> <li>• Measure accurately and precisely using a range of equipment.</li> <li>• Know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</li> <li>• Use the outcome of test results to make predictions and set up a further comparative and fair tests.</li> <li>• Report findings from enquiries in a range of ways.</li> <li>• Know how to explain a conclusion from an enquiry.</li> <li>• Explain causal relationships in an enquiry.</li> <li>• Know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.</li> <li>• Read, spell and pronounce scientific vocabulary accurately.</li> </ul>	
Biology	<p><b>Plants</b></p> <ul style="list-style-type: none"> <li>• Know the function of different parts of flowering plants and trees.(F)</li> <li>• Know what different plants need to help them survive.(F)</li> <li>• Know how water is transported within plants.(F)</li> <li>• Know the plant life cycle, especially the importance of flowers.(F)</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>• Know about the importance of a nutritious, balanced diet.(SW)</li> <li>• Know how nutrients, water and oxygen are transported within animals and humans.(SW)</li> <li>• Know about the skeletal system of a human.(SW)</li> <li>• Know about the muscular system of a human.(SW)</li> <li>• Know about the purpose of the skeleton in humans and animals.(SW)</li> </ul>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>• Group living things in different ways. (MMS)</li> <li>• Use classification keys to group, identify and name living things. (MMS)</li> <li>• Create classification keys to group, identify and name living things (for others to use). (MMS)</li> <li>• Know how changes to an environment could endanger living things.(MMS)</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>• Identify and name the parts of the human digestive system. (BBB)</li> <li>• Know the functions of the organs in the human digestive system. (BBB)</li> <li>• Identify and know the different types of teeth in humans. (BBB)</li> <li>• Know the functions of different human teeth. (BBB)</li> <li>• Use food chains to identify producers, predators and prey. (BBB)</li> <li>• Construct food chains to identify producers, predators and prey. (BB)</li> </ul>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>• Know the life cycle of different living things, e.g. mammal, amphibian, insect bird. (A)</li> <li>• Know the differences between different life cycles.(A)</li> <li>• Know the process of reproduction in plants.(A)</li> <li>• Know the process of reproduction in animals.(A)</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>• Create a timeline to indicate stages of growth in humans. (A)</li> </ul>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>• Classify living things into broad groups according to observable characteristics and based on similarities and differences.(FK, DD)</li> <li>• Know how living things have been classified.(DD)</li> <li>• Give reasons for classifying plants and animals in a specific way.(DD)</li> </ul> <p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>• Identify and name the main parts of the human circulatory system.(BH)</li> <li>• Know the function of heart, blood vessels, blood.(BH)</li> <li>• Know the impact of diet, exercise, drugs and life style on health.(BH)</li> <li>• Know the ways in which nutrients and water are transported in animals, including humans.(BH)</li> </ul> <p><b>Evolution and inheritance</b></p> <ul style="list-style-type: none"> <li>• Know how the Earth and living things have changed over time.(DD)</li> <li>• Know fossils can be used to find out about past.(DD)</li> <li>• Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).(DD)</li> <li>• Know how animals and plants are adapted to suit their environment.(FK, DD)</li> <li>• Link adaptation over time to evolution. (FK, DD)</li> <li>• Know about evolution and can explain what it is.(DD)</li> </ul>

	Year 3 Scientist	Year 4 Scientist	Year 5 Scientist	Year 6 Scientist
Chemistry	<p><b>Rocks</b></p> <ul style="list-style-type: none"> <li>• Compare and group rocks based on their appearance and physical properties, giving a reason. (T)</li> <li>• Know about and explain the difference between sedimentary, metamorphic and igneous rock.(T)</li> <li>• Know how fossils are formed.(SW)</li> <li>• Know how soil is made. (F)</li> </ul>	<p><b>States of matter</b></p> <ul style="list-style-type: none"> <li>• Group materials based on their state of matter (solid, liquid, gas). (Po)</li> <li>• Know how some materials can change state. (MMS, Po)</li> <li>• Explore how materials change state. (Po)</li> <li>• Measure the temperature at which materials change state. (Po)</li> <li>• Know about the water cycle. (MMS)</li> <li>• Know the part played by evaporation and condensation in the water cycle. (MMS, Po)</li> </ul>	<p><b>Properties and changes of materials</b></p> <ul style="list-style-type: none"> <li>• Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical &amp; thermal], and response to magnets). (AI)</li> <li>• Know how a material dissolves to form a solution; explaining the process of dissolving. (AI)</li> <li>• Know and show how to recover a substance from a solution.(AI)</li> <li>• Know how some materials can be separated.</li> <li>• Demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating). (AI)</li> <li>• Know and can demonstrate that some changes are reversible and some are not. (AI, SW)</li> <li>• Know how some changes result in the formation of a new material and this is usually irreversible.(SW)</li> <li>• Know about reversible and irreversible changes. (SW)</li> <li>• Give evidenced reasons why materials should be used for specific purposes. (AI)</li> </ul>	<p><b>No content</b></p>
Physics	<p><b>Light</b></p> <ul style="list-style-type: none"> <li>• Know what dark is (the absence of light). (UP)</li> <li>• Know that light is needed in order to see. (UP)</li> <li>• Know that light is reflected from a surface. (UP)</li> <li>• Know and demonstrate how a shadow is formed. (UP)</li> <li>• Explore shadow size and explain the changes. (UP)</li> <li>• Know the danger of direct sunlight and describe how to keep protected. (UP)</li> </ul> <p><b>Forces and magnets</b></p> <ul style="list-style-type: none"> <li>• Know about and describe how objects move on different surfaces.(MM)</li> <li>• Know how some forces require contact and some do not, giving examples. (MM)</li> <li>• Know about and explain how objects attract and repel in relation to objects and other magnets. (MM)</li> <li>• Predict whether objects will be magnetic and carry out an enquiry to test this out. (MM)</li> <li>• Know how magnets work. (MM)</li> <li>• Predict whether magnets will attract or repel and give a reason. (MM)</li> </ul>	<p><b>Sound</b></p> <ul style="list-style-type: none"> <li>• Know how sound is made. (PI)</li> <li>• Know how sound travels from a source to our ears.(PI)</li> <li>• Know how sounds are made, associating some of them with vibrating.(PI)</li> <li>• Know the correlation between pitch and the object producing a sound. (PI)</li> <li>• Know the correlation between the volume of a sound and the strength of the vibrations that produced it.(PI)</li> <li>• Know what happens to a sound as it travels away from its source. (PI)</li> </ul> <p><b>Electricity</b></p> <ul style="list-style-type: none"> <li>• Identify and name appliances that require electricity to function. (IAW)</li> <li>• Construct a series circuit. (IAW)</li> <li>• Identify and name the components in a series circuit (including cells, wires, bulbs, switches, buzzers). (IAW)</li> <li>• Know how to draw a circuit diagram. (IAW)</li> <li>• Predict and test whether a lamp will light in a circuit.(IAW)</li> <li>• Know the function of a switch in a circuit. (IAW)</li> <li>• Know the difference between a conductor and an insulator; giving examples of each. (IAW)</li> </ul>	<p><b>Earth and space</b></p> <ul style="list-style-type: none"> <li>• Know about and explain the movement of the Earth and other planets relative to the Sun.(S)</li> <li>• Know about and explain the movement of the Moon relative to the Earth.(S)</li> <li>• Know and demonstrate how night and day are created.(S)</li> <li>• Describe the Sun, Earth and Moon (using the term spherical). (S)</li> </ul> <p><b>Forces</b></p> <ul style="list-style-type: none"> <li>• Know what gravity is and its impact on our lives.(SM)</li> <li>• Identify and know the effect of air resistance.(SM)</li> <li>• Identify and know the effect of water resistance.(SM)</li> <li>• Identify and know the effect of friction.(SM)</li> <li>• Explain how levers, pulleys and gears allow a smaller force to have a greater effect.(SM)</li> </ul>	<p><b>Light</b></p> <ul style="list-style-type: none"> <li>• Know how light travels.(HM)</li> <li>• Know and demonstrate how we see objects.(HM)</li> <li>• Know why shadows have the same shape as the object that casts them.(HM)</li> <li>• Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.(SW)</li> </ul> <p><b>Electricity</b></p> <ul style="list-style-type: none"> <li>• Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.(SW)</li> <li>• Compare and give reasons for why components work and do not work in a circuit.(SW)</li> <li>• Draw circuit diagrams using correct symbols.(SW)</li> </ul>
Themes	<ul style="list-style-type: none"> <li>• Tremors (T)</li> <li>• Tribal Tales (TT)</li> <li>• Mighty Metals (MM)</li> <li>• Urban Pioneers (UP)</li> <li>• Gods and Mortals (GM)</li> <li>• Flow (F)</li> </ul>	<ul style="list-style-type: none"> <li>• Burps, Bottoms and Bile (BBB)</li> <li>• I am Warrior (IW)</li> <li>• Traders and Raiders (TR)</li> <li>• Potions (Po)</li> <li>• Misty Mountain Sierra (MMS)</li> <li>• Playlists (PI)</li> </ul>	<ul style="list-style-type: none"> <li>• Off with her head (OWH)</li> <li>• Alchemy Island (AI)</li> <li>• Pharaohs (Ph)</li> <li>• Stargazers (S)</li> <li>• Scream Machine (SM)</li> <li>• Allotment (A)</li> </ul>	<ul style="list-style-type: none"> <li>• Darwin's Delights (DD)</li> <li>• Blood Heart (BH)</li> <li>• Frozen Kingdom (FK)</li> <li>• Child's War (CW)</li> <li>• Hola Mexico (HM)</li> </ul>