

Science Key Milestones and Progression

| EYFS | KS1 | KS2 |
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| <p>At the end of EYFS, children will be able to ask simple questions about objects and materials they are investigating. Through doing so, they will make observations using simple equipment and be able to talk about what they are doing, and what they have found out.</p> <p>Children in EYFS will carry out a range of activities allowing them to explore materials in a sensory way, including natural materials.</p> <p>Children will be able to investigate through play and exploration and explain to an adult why they are doing this, and how this relates to their current learning.</p> <p>Children are able to concentrate and keep on trying if they encounter difficulties through active learning, and are therefore able to celebrate achievements.</p> <p>Children are beginning to think critically by the end of EYFS, by developing their own ideas, becoming more observant in their observations and making links between ideas.</p> | <p>By the end of KS1, children develop their ability to ask questions (such as what something is, how something is different or similar, how things happen). They are then able to apply their knowledge from what they have learnt, to answer these.</p> <p>Children are also able to use resources to answer questions using different types of enquiry, and therefore allowing them to recognise that there are different ways in which questions can be answered.</p> <p>Children will explore the world around them by making careful observations to identify, compare and notice change over time. They will also begin to take simple measurements, often using non-standard units.</p> <p>By the end of Year 2, children can use practical resources to gather evidence in order to answer questions asked by their teacher. They carry out tests, pattern seeking enquiries and make observations over time.</p> <p>Children are able to record their observations using photographs, drawings, diagrams or in their writing. They begin to record measurements and can classify using pre-prepared tables and sorting rings.</p> <p>At the end of KS1, children are able to use and understand simple secondary sources to aid their learning and to answer questions.</p> | <p>By the end of their learning journey at Clifton, a capable scientist will be able to independently ask scientific questions. This may be as a result of scientific investigations or involve asking further questions based on their developed understanding following an enquiry.</p> <p>When given a wide range of resources, a KS2 scientist can decide for themselves how to gather evidence to answer a scientific question. They are also able to confidently use secondary sources to assist in their enquiry and to answer questions they cannot answer themselves.</p> <p>By the end of KS2, children are able to select appropriate measuring equipment to give precise and accurate results (e.g. ruler, tape measure, suitable scales). They act decisively and consider whether they need to repeat readings, adjust any observations, or check other secondary sources to see if they are correct.</p> <p>Children record their data using annotated photographs, labelled diagrams, observational drawings or through their writing. They are also able to record measurements appropriately and classification.</p> <p>A Clifton scientist in KS2 is able to talk about scientific discoveries and new developments that they may have heard about or seen in the news. They can talk about how this may or may not affect them.</p> <p>Children are able to explain their findings and how this links with what they have learnt. They then use this information alongside their subject knowledge to question results and draw conclusions from their findings.</p> <p>Children are reflective and can evaluate their methods, measurements and assess the credibility of secondary sources.</p> <p>By the end of Year 6, children are confident in communicating their answers, opinions and findings whilst using relevant scientific language in their explanations.</p> |

Science – Progression in Working Scientifically

| EYFS | KS1 | LKS2 | UKS2 |
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| <p>Children can ask questions to demonstrate curiosity about the world around them.</p> <p>Children can make predictions with support or prompting and talk about what they think might happen based on their own experiences.</p> <p>Children can decide how to carry out a simple enquiry. They can respond to prompts to say what happened to objects, living things or events.</p> <p>Children use senses and simple equipment to explore the world around them and to take simple measurements, e.g. binoculars and magnifying glasses.</p> <p>Children can record and share data by talking to an adult about what has been found/found out.</p> <p>Children can answer questions using data with support, to explain why some things occur.</p> <p>Children can make conclusions with support, and talk about what they have found out or what they think might happen next/change based on their own experiences.</p> | <p>Children can ask simple questions and recognise that they can be answered in different ways.</p> <p>Children can observe closely and use simple equipment.</p> <p>Children can perform simple tests.</p> <p>Children can identify and classify.</p> <p>Children can use their observations and ideas to suggest answers to questions.</p> <p>Children can gather and record data to help in answering questions.</p> | <p>Children can ask relevant questions and using different types of scientific enquiries to answer them.</p> <p>Children can set up simple practical enquiries, comparative and fair tests.</p> <p>Children can make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Children can gather, record, classify and present data in a variety of ways to help in answering questions.</p> <p>Children can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Children can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Children can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Children can identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Children can use straightforward scientific evidence to answer questions or to support their findings.</p> | <p>Children can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Children can take measurements, using a range of scientific equipment, with increasing accuracy and precision, take repeat readings when appropriate.</p> <p>Children can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Children can use test results to make predictions to set up further comparative and fair tests.</p> <p>Children can report and present 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.</p> <p>Children can identify scientific evidence that has been used to support or refute ideas or arguments.</p> |

Science – Progression in Key Learning

| Topic | Nursery | Reception | Year 1 | Year 2 |
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| Plants | <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Explore collections of materials with similar and/or different properties.</p> <p>Plant seeds and care for growing plants.</p> <p>Understand the key features of the life cycle of a plant and an animal.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Grow plants.</p> | <p>Explore the natural world around them.</p> <p>Describe what they see, hear and feel whilst outside.</p> <p>Understand the effect of changing seasons on the natural world around them.</p> <p>Grow plants.</p> | <p>Children can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. <i>(3a)</i></p> <p>Children can identify and describe the basic structure of a variety of common flowering plants, including trees. <i>(3a)</i></p> | <p>Children can observe and describe how seeds and bulbs grow into mature plants. <i>(3a)</i></p> <p>Children can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. <i>(3a)</i></p> |

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| Animals including Humans | <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Begin to make sense of their own life-story and family's history.</p> <p>Understand the key features of the life cycle of a plant and an animal.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Learn about the life cycles of animals.</p> <p>Compare adult animals to their babies.</p> <p>Observe how baby animals change over time.</p> | <p>Talk about members of their immediate family and community.</p> <p>Name and describe people who are familiar to them.</p> <p>Recognise some environments that are different to the one in which they live.</p> <p>Name and describe animals that live in different habitats.</p> <p>Describe different habitats.</p> <p>Learn about how to take care of themselves.</p> | <p>Children can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (2a)</p> <p>Children can identify and name a variety of common animals that are carnivores, herbivores and omnivores. (2a)</p> <p>Children can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets). (2a)</p> <p>Children can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (2a)</p> | <p>Children can notice that animals, including humans, have offspring which grow into adults. (1a, 1b)</p> <p>Children can find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (1a, 1b)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (1a, 1b)</p> |
| Materials | <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Explore collections of materials with similar and/or different properties.</p> <p>Talk about the differences between materials and changes they notice.</p> <p>Shape and join materials.</p> <p>Combine and mix ingredients.</p> <p>Change materials by heating and cooling, including cooking.</p> | <p>Explore the natural world around them.</p> <p>Describe what they see, hear and feel whilst outside.</p> <p>Make objects from different materials, including natural materials.</p> <p>Observe, measure and record how materials change when heated and cooled.</p> <p>Compare how materials change over time and in different conditions.</p> | <p>Everyday Materials</p> <p>Children can distinguish between an object and the material from which it is made. (1a)</p> <p>Children can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (1a)</p> <p>Children can describe the simple physical properties of a variety of everyday materials. (1a)</p> <p>Children can compare and group together a variety of everyday materials on the basis of their simple physical properties. (1a)</p> | <p>Everyday Materials</p> <p>Children can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (2a, 2b)</p> <p>Children can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (2a, 2b)</p> |
| Seasonal changes | <p>Understand the key features of the life cycle of a plant and an animal.</p> | <p>Explore the natural world around them.</p> <p>Describe what they see, hear and feel whilst outside.</p> <p>Understand the effect of changing seasons on the natural world around them.</p> <p>Play and explore outside in all seasons and in different weather.</p> <p>Observe living things throughout the year.</p> | <p>Children can observe changes across the 4 seasons. (2b, 3b)</p> <p>Children can observe and describe weather associated with the seasons and how day length varies. (2b, 3b)</p> | |
| Living Things and their habitats | <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Explore collections of materials with similar and/or different properties.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Explore the surrounding natural environment.</p> <p>Explore natural objects from the surrounding environment.</p> | <p>Draw information from a simple map.</p> <p>Explore the natural world around them.</p> <p>Describe what they see, hear and feel whilst outside.</p> <p>Recognise some environments that are different to the one in which they live.</p> <p>Explore the plants in the surrounding natural environment.</p> <p>Explore the animals in the surrounding natural environment.</p> <p>Explore plants and animals in a contrasting natural environment.</p> | | <p>Children can explore and compare the differences between things that are living, dead, and things that have never been alive. (3b)</p> <p>Children can identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. (3b)</p> <p>Children can identify and name a variety of plants and animals in their habitats, including microhabitats. (3b)</p> <p>Children can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. (3b)</p> |

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| Light | Explore how things work. Talk about the differences in materials and changes they notice. Explore light sources. Shine light on or through different materials. | Describe what they see, hear and feel whilst outside. Explore shadows. Explore rainbows. | | |
| Forces | Explore how things work. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice. | Explore how to change how things work. Explore how the wind can move objects. Explore how objects move in water. | | |
| Rocks | | Explore the natural world around them. | | |
| Sound | Listen to sounds. Make sounds. | Describe what they see, hear and feel whilst outside. Listen to sounds outside and identify the source. Make sounds. | | |
| Electricity | Identify electrical devices. Use battery-powered devices. | | | |
| The Earth in Space | | Explore the natural world around them. Describe what they see, hear and feel whilst outside. Learn about the Earth, Sun, Moon, planets and stars. Learn about space travel. | | |

| | Year 3 | Year 4 | Year 5 | Year 6 |
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| Plants | <p>Children can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. <i>(1a, 1b)</i></p> <p>Children can explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. <i>(1a, 1b)</i></p> <p>Children can investigate the way in which water is transported within plants. <i>(1a, 1b)</i></p> <p>Children can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <i>(1a, 1b)</i></p> | | | |
| Animals including Humans | <p>Children can identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. <i>(2a)</i></p> <p>Children can identify that humans and some other animals have skeletons and muscles for support, protection and movement. <i>(2a)</i></p> | <p>Children can describe the simple functions of the basic parts of the digestive system in humans. <i>(2a)</i></p> <p>Children can identify the different types of teeth in humans and their simple functions. <i>(2a)</i></p> <p>Children can construct and interpret a variety of food chains, identifying producers, predators and prey. <i>(2a)</i></p> <p>Children can describe the simple functions of the basic parts of the digestive system in humans. <i>(2a)</i></p> | <p>Children can describe the changes as humans develop to old age. <i>(3b)</i></p> | <p>Children can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. <i>(2b)</i></p> <p>Children can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. <i>(2b)</i></p> <p>Children can describe the ways in which nutrients and water are transported within animals, including humans. <i>(2b)</i></p> |
| Materials | | | <p>Properties and Changes of Materials</p> <p>Children can compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. <i>(1a, 1b)</i></p> <p>Children can know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. <i>(1a, 1b)</i></p> <p>Children can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. <i>(1a, 1b)</i></p> <p>Children can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. <i>(1a, 1b)</i></p> <p>Children can demonstrate that dissolving, mixing and changes of state are reversible changes. <i>(3a)</i></p> <p>Children can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. <i>(3a)</i></p> | |

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| <p>Living things and their habitats</p> | | <p>Children can recognise that living things can be grouped in a variety of ways. (3a) Children can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (3a) Children can recognise that environments can change and that this can sometimes pose dangers to living things. (1b)</p> | <p>Children can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (3b) Children can describe the life process of reproduction in some plants and animals. (3b)</p> | <p>Children can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (2a) Children can give reasons for classifying plants and animals based on specific characteristics. (2a)</p> |
| <p>Light</p> | <p>Children can recognise that they need light in order to see things and that dark is the absence of light. (3a) Children can notice that light is reflected from surfaces. (3a) Children can recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (3a) Children can recognise that shadows are formed when the light from a light source is blocked by an opaque object. (3a) Children can find patterns in the way that the size of shadows change. (3a)</p> | | | <p>Children can recognise that light appears to travel in straight lines. (1a) Children can 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. (1a) Children can 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. (1a) Children can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. (1a)</p> |
| <p>Forces</p> | <p>Forces and Magnets Children can compare how things move on different surfaces. (3b) Children can notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. (3b) Children can observe how magnets attract or repel each other and attract some materials and not others. (3b) Children can 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. (3b) Children can describe magnets as having 2 poles. (3b) Children can predict whether 2 magnets will attract or repel each other, depending on which poles are facing. (3b)</p> | | <p>Forces Children can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (2a) Children can identify the effects of air resistance, water resistance and friction, that act between moving surfaces. (2a) Children can recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. (2a)</p> | |
| <p>Rocks</p> | <p>Children can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. b) Children can describe in simple terms how fossils are formed when things that have lived are trapped within rock. (2b) Children can recognise that soils are made from rocks and organic matter. (2b)</p> | | | |

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| States of Matter | | <p>Children can compare and group materials together, according to whether they are solids, liquids or gases. <i>(1a)</i></p> <p>Children can observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). <i>(1a)</i></p> <p>Children can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <i>(1a)</i></p> | | |
| Sound | | <p>Children can identify how sounds are made, associating some of them with something vibrating. <i>(2b)</i></p> <p>Children can recognise that vibrations from sounds travel through a medium to the ear. <i>(2b)</i></p> <p>Children can find patterns between the pitch of a sound and features of the object that produced it. <i>(2b)</i></p> <p>Children can find patterns between the volume of a sound and the strength of the vibrations that produced it. <i>(2b)</i></p> <p>Children can recognise that sounds get fainter as the distance from the sound source increases. <i>(2b)</i></p> | | |
| Electricity | | <p>Children can identify common appliances that run on electricity. <i>(3b)</i></p> <p>Children can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. <i>(3b)</i></p> <p>Children can 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. <i>(3b)</i></p> <p>Children can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. <i>(3b)</i></p> <p>Children can recognise some common conductors and insulators, and associate metals with being good conductors. <i>(3b)</i></p> | | <p>Children can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. <i>(1b)</i></p> <p>Children can 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. <i>(1b)</i></p> <p>Children can use recognised symbols when representing a simple circuit in a diagram. <i>(1b)</i></p> |

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| <p style="text-align: center;">Earth and Space</p> | | | <p>Children can describe the movement of the Earth and other planets relative to the sun in the solar system. <i>(2b)</i></p> <p>Children can describe the movement of the moon relative to the Earth. <i>(2b)</i></p> <p>Children can describe the sun, Earth and moon as approximately spherical bodies. <i>(2b)</i></p> <p>Children can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. <i>(2b)</i></p> | |
| <p style="text-align: center;">Evolution</p> | | | | <p>Children can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. <i>(3b)</i></p> <p>Children can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. <i>(3b)</i></p> <p>Children can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. <i>(3b)</i></p> |