

Langley Park Primary Academy Science Progression Map

SCIENCE	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Nursery	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary.	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary.	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary.	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.
Reception	Explore the natural world around them. Describe what they see, hear and feel whilst outside Understand the effect of changing seasons on the natural world around them.	Explore the natural world around them. Describe what they see, hear and feel whilst outside Understand the effect of changing seasons on the natural world around them.	Explore the natural world around them. Describe what they see, hear and feel whilst outside Understand the effect of changing seasons on the natural world around them.	Explore the natural world around them. Describe what they see, hear and feel whilst outside Understand the effect of changing seasons on the natural world around them.	Explore the natural world around them. Describe what they see, hear and feel whilst outside Understand the effect of changing seasons on the natural world around them.	Explore the natural world around them. Describe what they see, hear and feel whilst outside Understand the effect of changing seasons on the natural world around them.
Year 1	Materials sinking and floating, working scientifically, Seasonal Changes Can they name the four seasons in order? Can they observe and describe weather associated with the seasons? Can they talk about weather variation in different parts of the world?	Seasonal Changes In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.	Plants Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring.	Animals Including Humans • Can name a range of animals which includes animals from each of the vertebrate groups • Can describe the key features of these named animals • Can label key features on a picture/diagram • Can write descriptively about an animal • Can write a 'What am I?' riddle about an animal • Can describe what a range of animals eat • Can play and lead 'Simon says' • During PE lessons, can follow instructions involving parts of the body • Can label parts of the body on pictures and diagrams • Can explore objects using different senses	Everyday Materials All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties.	

<p>Year 2</p>	<p>Plants Can they describe what plants need to survive? Can they observe and describe how seeds and bulbs grow into mature plants? Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy? Can they describe what plants need to survive and link it to where they are found? Can they explain that plants grow and reproduce in different ways?</p>	<p>Transdisciplinary:Classifying and Grouping Materials Can they describe the simple physical properties of a variety of everyday materials? Can they compare and group together a variety of materials based on their simple physical properties? Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc.? Can they sort materials into groups and say why they have sorted them in that way? Can they say which materials are natural and which are man made?</p>	<p>Transdisciplinary: Classifying and grouping materials Observing Closely - Can they use their senses (see, touch, smell, hear or taste) to help them answer questions? Can they use some scientific words to describe what they have seen and measured? Can they compare several things? Identifying and Classifying - Can they organise things into groups? Can they find simple patterns (or associations)? Recording Findings- Can they use text, diagrams, pictures, charts, tables to record their observations? Classifying and Grouping Materials - Can they describe the simple physical properties of a variety of everyday materials? Can they compare and group together a variety of materials based on their simple physical properties? Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc.? Can they sort materials into groups and say why they have sorted them in that way? Can they say which materials are natural and which are man made? Materials hunt around the school looking at properties of materials Using properties to group materials.</p>	<p>Transdisciplinary:living things and their habitats + plants: match certain living things to the habitats they are found in explain the differences between living and non-living things describe some of the life processes common to plants and animals, decide whether something is living, dead or non-living describe how a habitat provides for the basic needs of things living there describe a range of different habitats describe how plants and animals are suited to their habitat name some characteristics of an animal that help it to live in a particular habitat describe what animals need to survive and link this to their habitats Plants Can they describe what plants need to survive? Can they observe and describe how seeds and bulbs grow into mature plants? Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy? Can they describe what plants need to survive and link it to where they are found? Can they explain that plants grow and reproduce in different ways? Use of discussion, walk around local environment identifying living/NL/ Never alive look at process of MRS GREN and use this to help classify living non/living. We will look at habitats from around the world including UK, Desert? mountains (links with geography and builds on previous taught map skills). Study animals found in those areas and how they have physically adapted</p>	<p>Transdisciplinary: changing material explore how the shapes of solid objects can be changed (squashing, bending, twisting, stretching) find out about people who developed useful new materials (John Dunlop, Charles Macintosh, John McAdam) identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses? explain how things move on different surfaces explain how materials are changed by heating and cooling explain how materials are changed by bending, twisting and stretching tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted Look at materials used to build houses both past and present and why some materials not used now. Children make houses using materials from 1666 . Use this as a hook to look at reversible and irreversible changes</p>	<p>Disciplinary: Animals including humans describe what animals need to survive explain that animals grow and reproduce explain why animals have offspring which grow into adults describe the life cycle of some living things? (e.g. egg, chick, chicken) explain the basic needs of animals, including humans for survival? (water, food, air) describe why exercise, balanced diet and hygiene are important for humans explain that animals reproduce in different ways Links will be made with T4 focus will be on life cycles of animals. Children given agency from a selection of animals to research life cycles</p>
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<p>Year 3</p>	<p>D. Light (recognise that they need light in order to see things, recognise that dark is the absence of light, notice that light is, recognise that light from the sun can be dangerous and that there are ways to protect their eyes reflected from surfaces, recognise that shadows are formed when the light from a light source is blocked by a solid object, find patterns in the way that the size of shadows change, explain why lights need to be bright or dimmer according to need, explain the difference between transparent, translucent and opaque, explain why lights need to be bright or dimmer according to need, why their shadow changes when the light source is moved closer or further from the object)</p>	<p>T.D- Forces including magnets (compare how things move on different surfaces, observe that magnetic forces can be transmitted without direct contact, observe how some magnets attract or repel each other, classify which materials are attracted to magnets and which are not, notice that some forces need contact between two objects, but magnetic forces can act at a distance, compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, identify some magnetic materials, investigate the strengths of different magnets and find fair ways to compare them)</p>	<p>T.D- Animals including humans (explain the importance of a nutritionally balanced diet, describe how nutrients, water and oxygen are transported within animals and humans, identify that animals, including humans, cannot make their own food: they get nutrition from what they eat, describe and explain the skeletal system of a human, describe and explain the muscular system of a human, explain how the muscular and skeletal systems work together to create movement, classify living things and non-living things by a number of characteristics that they have thought of, explain how people, weather and the environment can affect living things, explain how certain living things depend on one another to survive.</p>	<p>D- Rocks (compare and group together different rocks on the basis of their appearance and simple physical properties, describe and explain how different rocks can be useful to us, describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed, describe in simple terms how fossils are formed when things that have lived are trapped within rock, recognise that soils are made from rocks and organic matter, classify igneous and sedimentary rocks, begin to relate the properties of rocks with their uses)</p>	<p>T.D- Plants (identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers), explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow, explain how they vary from plant to plant, investigate the way in which water is transported within plants, explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal, classify a range of common plants according to many criteria (environment found, size, climate required, etc.)</p>	<p>D- working scientifically (use different ideas and suggest how to find something out, make and record a prediction before testing, plan a fair test and explain why it was fair, set up a simple fair test to make comparisons, explain why they need to collect information to answer a question, record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables</p>
<p>Year 4</p>	<p>Living Things and their Habitats. Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.</p> <p>Living things live in a habitat which provides an environment to which they are suited (Year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). These environments also change with the seasons; different living things can be found in a habitat at different times of the year.</p>	<p>Electricity - Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off.</p> <p>Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity.</p>	<p>Sound - A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.</p> <p>The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively.</p> <p>Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.</p>	<p>States of Matter - A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.</p> <p>Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0°C. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100°C. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.</p> <p>Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.</p>	<p>Working Scientifically - Recapping through experiments.</p>	<p>Animals, Including Human's - Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added.</p> <p>The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.</p> <p>Humans have four types of teeth: incisors for cutting, canines for tearing, and molars and premolars for grinding (chewing). Living things can be classified as producers, predators and prey according to their place in the food chain.</p>

<p>Year 5</p>	<p>Disciplinary - Materials Planning Part 1- Scientific Enquiry Skills (to be developed through the year). Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary? Can they make a prediction with reasons? Can they use test results to make predictions to set up comparative and fair tests? Can they present a report of their findings through writing, display and presentation? Can they explore different ways to test an idea, choose the best way and give reasons? Can they vary one factor whilst keeping the others the same in an experiment? Can they use information to help make a prediction? Can they explain, in simple terms, a scientific idea and what evidence supports it? Obtaining and Presenting Evidence Can they take measurements using a range of scientific equipment with increasing accuracy and precision? Can they take repeat readings when appropriate? Can they record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs? Can they decide which units of measurement they need to use? Can they explain why a measurement needs to be repeated? Properties and Changes to Materials Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets? Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic? Can they describe changes using scientific words? (evaporation, condensation) Can they work out which materials are most effective for keeping us warm or for keeping something cold?</p>	<p>Transdisciplinary - Ecosystems, Space, Earth and Space Can they identify and explain the movement of the Earth and other plants relative to the sun in the solar system? Can they explain how seasons and the associated weather is created? Can they describe and explain the movement of the Moon relative to the Earth? Can they describe the sun, earth and moon as approximately spherical bodies? Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky? Can they compare the time of day at different places on the earth? Can they create shadow clocks? Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge? Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)</p>	<p>Transdisciplinary - Lifecycle and animal migration Animals Including Humans Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies? Can they draw a timeline to indicate stages in the growth and development of humans? Living Things and Their Habitats Can they describe the differences in the life cycles of a mammal, an amphibians, an insects and a bird? Can they describe the life cycles of common plants? Can they explore the work of well know naturalists and animal behaviourists? (David Attenborough and Jane Goodall) Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border? Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?</p>	<p>Transdisciplinary: expression of human history (using science to demonstrate the development of civilisation). Can they explain what gravity is and its impact on our lives? • Can they explain why a wheeled object that is initially pushed will slow down and stop? • Can they explain the impact of friction on a moving object? • Can they explain the effect of drag force on moving objects? • Can they explain how force and motion can be transferred through gears, pulleys, levers and springs? Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction) • Can they design very effective parachutes? • Can they work out how water can cause resistance to floating objects?</p>	<p>Transdisciplinary: magnetism -organisation. Can they explain how the force of magnetism works? • Can they describe how magnetism is used in everyday objects? • Can they describe magnets as having two poles? • Can they make predictions associated with whether two magnets will attract or repel depending on which poles are facing? Can they work out how magnets are useful in an everyday context? • Can they work out the link between magnets and the North and South poles?</p>	<p>Transdisciplinary: Peace and Conflict (resource need). Can they test and group materials based on scientific evidence? (hardness, solubility, transparency, conductivity, insulation, magnetism) • Can they explain the process of dissolving? • Can they recover a substance from a solution? • Can they decide how a mixture would best be separated? (filtering, sieving, evaporating) • Can they give reasons for the uses of everyday materials based on scientific evidence? • Can they show what they know about the properties of different materials? • Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gasses) • Can they describe changes using scientific words? (evaporation, condensation) • Can they use the terms 'reversible' and 'irreversible'? Year 5 (challenging) Properties and changes to materials • Can they describe methods for separating mixtures? (filtration, distillation) • Can they work out which materials are most effective for keeping us warm or for keeping something cold?</p>
<p>Year 6</p>	<p>ANIMALS INCLUDING HUMANS - How the body works, linked into Victorians and how they made medical advances. Heart dissection, find out about and describe the basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>EVOLUTION AND INHERITANCE Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago? Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents? Can they give reasons why offspring are not identical to each other or to their parents? Can they explain the process of evolution and describe the evidence for this? Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution? Can they talk about the work of Charles Darwin. Can they explain how some living things adapt to survive in extreme conditions? Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet? Can they begin to understand what is meant by DNA? A full term was given to different areas of the above, linking into our key texts of skelling and Moth.</p>	<p>ANIMALS INCLUDING HUMANS - How the body works, linked into Victorians and how they made medical advances. Heart dissection, find out about and describe the basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>LIGHT - Can they recognise that light appears to travel in straight lines? Can they 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? Can they 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? Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them? Can they explain how different colours of light can be created? Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope) Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.</p>	<p>ELECTRICITY - Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers) Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches? Can they use recognised symbols when representing a simple circuit in a diagram? Can they make their own traffic light system or something similar? Can they explain the danger of short circuits? Can they explain what a fuse is? Can they explain how to make changes in a circuit? Can they explain the impact of changes in a circuit? Can they explain the effect of changing the voltage of a battery?</p>	<p>ANIMALS INCLUDING HUMANS - Can they describe the ways in which nutrients and water and transported within animals, including humans? Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function? Looking at nutrients and then diet, exercise, drugs and lifestyle.</p>