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# Core themes & concepts progression map: Science

| Cycle A | EYFS | Years 1 & 2 | Years 3 & 4 | Years 5 & 6 |
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| Autumn Term | *Traditional Tales*<br>Seasons<br>Everyday Materials | *If you go down to the woods today, what will you find?*<br>Living Things & their habitats<br>Seasons<br>Working scientifically<br><br>*How is the UK different from the artic regions?*<br>Everyday Materials<br>Working scientifically | *What did the Romans do for Doncaster?*<br>Everyday Materials - Rocks<br>Light<br>Working scientifically | *What makes the earth angry?*<br>Plants & Growing<br>Working scientifically<br>Light |
| Spring Term | *People who Help Us*<br>Animals including humans<br><br>*Growing*<br>Living Things & their habitats<br>Plants & Growing<br>Working scientifically | *Which wonder would you visit?*<br>Everyday Materials<br>Seasons<br>Working scientifically | *Would you rather live in the UK or Italy?*<br>Forces & Magnets<br>Working scientifically | *Tudors*<br>Evolution<br>Working scientifically |
| Summer Term | *Under the Sea*<br>Living Things & their habitats<br>Working scientifically | *Why do people love to be besides the seaside?*<br>Seasons<br>Animals including humans<br>Working scientifically | *What is a rainforest?*<br>Animals including humans<br>Plants & Growing<br>Working scientifically | *Rivers and Coasts*<br>Living Things & their habitats<br>Working scientifically |

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| Cycle B | EYFS | Years 1 & 2 | Years 3 & 4 | Years 5 & 6 |
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| Autumn Term | *Changing Seasons*<br>Seasons<br>Working scientifically | *Where did all the castles come from?*<br>Everyday Materials<br>Seasons<br>Working scientifically<br><br>*How do we stay healthy?*<br>Animals including humans<br>Seasons<br>Working scientifically | *Lost Lands*<br>Sound<br>States of matter<br>Working scientifically | *North America/ Mayans*<br>Living Things & their habitats<br>Working scientifically |
| Spring Term | *Dinosaurs*<br>Working scientifically<br>Living Things & their habitats<br><br>*In the Garden*<br>Living Things & their habitats<br>Working scientifically | *How has Mexborough changed and what will it look like in the future?*<br>Everyday Materials<br>Plants & Growing<br>Working scientifically | *How did Early Man survive?*<br>Electricity<br>Working scientifically | *Why were Vikings successful invaders?* |
| Summer Term | *On Safari*<br>Living Things & their habitats<br><br>*Superheroes*<br>Forces | *Why do people visit London?*<br>Living Things & their habitats<br>Seasons<br>Working scientifically | *Extreme Planet*<br>Living Things & their habitats<br>Animals including humans<br>Working scientifically | *What happened to all the coal mines?* |

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# Progression of skills & knowledge for key themes/ concepts

| **Living Things & their habitats** | | |
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| **EYFS** | • Children have learnt about what a habitat is and have looked into examples. Link to bears from Goldilocks, different types of bears (polar, brown, black)<br>• On Safari/On the Farm – children have learnt about the different safari/farm animals and what they need to survive in Africa/ on the farm.<br>• Children look at the weather each day and describe it using the following vocabulary (rain, snow, wind, sun)<br>• Children visit the wildlife garden to explore what living things they will find and their habitat. | |
| **Year 1 & 2**<br>Living things and their habitats | • **I**dentify 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.<br>• **I**dentify and name a variety of plants and animals in their habitats, including micro-habitats (rainforest, polar, desert, ocean, woodland).<br>• 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. Children can use a basic food chain with 3 animals. They understand the vocab prey and predator.<br>• Children can what living things need to stay alive and healthy. They know the difference between living, dead or never been alive. | |
| Seasons | • Observe changes across the four seasons and describe the weather associated with the seasons and how day length varies | |
| **Year 3 & 4**<br>Living things and their habitats | • Recognise that living things can be grouped in a variety of ways.<br>• Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment<br>• Children have used classification to sort animals using a dichotomous key including their habitats.<br>• Children know the difference between vertebrates and invertebrates and can sort them into groups.<br>• Children can recognise that environments can change and that this can sometimes pose dangers to living things. | |
| **Year 5 & 6**<br>Living things and their habitats | • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.<br>• Describe the life process of reproduction in some plants and animals. | • Describe how things are classified into broad groups according to common observable characteristics and based on similarities and |

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| | | differences, including micro-organisms, plants and animals<br>• Give reasons for classifying plants and animals based on specific characteristics |
| **Materials** | | |
| **EYFS** | • Children use the workshop area to explore with different materials – boxes, pasta, bottle tops, tape etc<br>• Children learn to manipulate materials with playdough<br>• Children mark make with different materials such as twigs, leaves, wooden blocks. | |
| **Year 1 & 2**<br>Materials | Year 1:<br>• Explain what a material is.<br>• Know the difference between an object and the material it is made from.<br>• Be able to name and find everyday materials: wood, glass, plastic, metal, rock.<br>• Be able to describe the properties of a material: hard/soft, shiny/dull, rough/smooth, bendy/not bendy.<br>• Be able to compare and group together different materials based on their properties. | Year 2:<br>• Be able to name and find everyday materials: water, brick, paper, card/cardboard, foil, fabric.<br>• Be able to describe the properties of a material: stretchy/stiff, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent.<br>• Be able to compare and group together different materials based on their properties.<br>• Be able to identify and compare the suitability of materials for a particular use.<br>• Be able to find out how the shape of a solid object can be changed by squashing, bending, twisting and stretching. |
| **Year 3 & 4**<br>Rocks<br>State of Matter | Rocks:<br>• Be able to describe the features of different rocks (see scheme of work)<br>• Be able to compare and group different rocks based on their appearance and simple properties.<br>• Be able to explain in simple terms how fossils are formed.<br>• Know that soils are made from rocks and other organic matter.<br><br>State of Matter:<br>• Be able to explain (verbally or pictorially) what a solid, liquid and gas is.<br>• Be able to compare and group materials together based on whether they are solids, liquids or gases. | |

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| | • Know that some materials change state depending on the temperature it is kept at.<br>• Be able to measure the temperature at which different changes of state happens in degrees Celsius. | |
| **Year 5 & 6**<br>Materials | • Be able to define the terms hardness, solubility, transparency, conductivity (electrical and thermal).<br>• Be able to compare and group together everyday materials based on the properties mentioned above, with the addition of response to magnets.<br>• Know that some materials will dissolve in a liquid to form a solution.<br>• Be able to describe how to recover a substance from a solution.<br>• Be able to explain how to separate a mixture by filtering, sieving and evaporating.<br>• Be able to explain that dissolving, mixing and changes of state are reversible.<br>• Be able to explain, with examples, that some changes form a new material and are not usually reversible.<br>• Use evidence to give reasons for the particular uses of everyday materials. | |
| **Animals including humans** | | |
| **EYFS** | • Children look after their own butterflies, they watch them from caterpillars to butterflies and then set them free. They learn the life cycle of a butterfly – egg, caterpillar, chrysalis, butterfly<br>• On the Farm – children learn about the animals which live on a farm. They visit Canon Hall Farm and experience seeing farm animals.<br>• On Safari – children learn about safari animals and what these animals need to survive. They visit Yorkshire Wildlife Park and see safari animals first hand. | |
| **Year 1 & 2**<br>Animals including humans | Year 1:<br>• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals<br>• identify and name a variety of common animals that are carnivores, herbivores and omnivores<br>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)<br>• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense | Year 2:<br>• notice that animals, including humans, have offspring which grow into adults<br>• find out about and describe the basic needs of animals, including humans, for survival (water, food and air)<br>• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene |

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| **Year 3 & 4**<br>Animals including humans | Year 3:<br>• 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<br>• identify that humans and some other animals have skeletons and muscles for support, protection and movement | Year 4:<br>• describe the simple functions of the basic parts of the digestive system in humans<br>• identify the different types of teeth in humans and their simple functions<br>• construct and interpret a variety of food chains, identifying producers, predators and prey |
| **Year 5 & 6**<br>Animals including humans<br>Evolution | Year 5:<br>• describe the changes as humans develop to old age | Year 6:<br>• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood<br>• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function<br>• describe the ways in which nutrients and water are transported within animals, including humans<br>• recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago<br>• recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents<br>• identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution |
| **Plants & growing** | | |
| **EYFS** | • Children look at the topic Growing where they learn how to grow their own Sunflowers. They care for their flower daily, learning that they need to give it water and sunlight to help it grow.<br>• Children visit the wildlife garden to explore what living things they will find and their habitat.<br>• They explore what vegetables you can grow in your garden and link this to healthy eating. | |

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| **Year 1 & 2**<br>Plants | Year 1:<br>• Identify and name a variety of common wild and garden plants.<br>• Children can identify trees, including deciduous and evergreen trees.<br>• Identify and describe the basic structure of a variety of common flowering plants (leaves, flowers, petals, roots, stem, bulb)<br>• Identify and describe the basic structure of a variety of trees (leaves, trunk, bark, roots, branches) | Year 2:<br>• Children observe and describe how seeds and bulbs grow into mature plants.<br>• Children can describe how plants need water, light and a suitable temperature to grow and stay healthy. |
| **Year 3 & 4**<br>Plants | • Identify and describe the functions of different parts of flowering plants: roots, bulb, branch, stem/trunk, leaves and flowers<br>• 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<br>• Children have investigated the way in which water is transported within plants.<br>• Children explore the part that flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. | |
| Senses | | |
| **Year 3 & 4**<br>Light<br>Sound | • Know that light is needed to see things and that light reflects off of surfaces to enable us to see them.<br>• Know that shadows are formed when light is blocked by an opaque or translucent object; and be able to state ways that a shadow may change as the light source changes.<br>• Recognise that the sun can be dangerous and identify ways to protect from it.<br>• Identify that vibrations cause sound and that these vibrations cause this sound travels to the ear through a medium, such as air.<br>• Identify that sound gets fainter as the source is further away.<br>• Identify that volume changes in relation to the size of the vibrations.<br>• Identify that pitch may change depending on the object vibrating. | |
| **Year 5 & 6**<br>Light | • Know that light travels in straight lines and use this to identify **how** light reflects into our eyes.<br>• Be able to explain how light travels from light sources either directly into our eyes, or by reflecting from a surface into our eyes.<br>• Know that objects have shadows which are the same shape and be able to explain this phenonium by considering that lights move in straight lines. | |

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| **Forces & Space** | |
| **Year 3 & 4**<br>Forces and Magnets | • Know that forces occur when two objects are in contact with each other and act upon each other. Use this to explore how objects move on different surfaces.<br>• Know that magnetic forces do not require physical contact to act.<br>• Know how magnets behave with each other with respect to their poles attracting or repelling.<br>• Be able to 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. |
| **Year 5 & 6**<br>Forces<br>Earth and Space | • Know that objects fall towards the Earth due to effects of gravity.<br>• Explore and know how other forces can act against the direction of movement, including air resistance, water resistance, and friction.<br>• Know that surface area and the size of air resistance, water resistance, and friction are related and be able to use this without formulaic specification. E.g. note that a larger surface area will lead to more resistance.<br>• Recognise that some features, such as levers and pulleys, may allow smaller objects to exact a greater effect.<br>• Know that the sun, Earth, and moon are approximately spherical.<br>• Understand the heliocentric view of the solar system and recognise this as correct.<br>• Describe how the moon orbits the Earth and explore the different stages of the lunar cycle.<br>• Use the rotation of the Earth to explain day and night, and why the sun appears to move across the sky. |
| **Electricity** | |
| **Year 3 & 4**<br>Electricity | • Be able to identify a range of common appliances which run on electricity (e.g. kettle, toaster, washing machine).<br>• Create a series circuit and identify the names of key components such as buzzers, cells, bulbs, etc.<br>• Identify, both pictorially and through physical investigation, whether a simple series circuit will work based on whether the circuit is complete. This could be explained or understood through considering whether a bulb will light.<br>• Explore how a switch will impact on whether a series circuit will work, and link this understanding to how a switch can close and open a circuit.<br>• Know what materials act as electrical insulators and which act as electrical conductors. Associate metals as good conductors. |
| **Year 5 & 6**<br>Electricity | • Use recognised symbols when representing circuits in a diagram.<br>• Recognise how the volume of a buzzer or brightness of a lamp is linked to the voltage.<br>• Compare variations in the functions of components and suggest reasons for such variations (such as multiple cells or other components). |
| **Working scientifically** | |
| **EYFS** | Asking and answering questions |

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| | • Understand 'why' questions, like: 'Why do you think the caterpillar got so fat?"<br>• Talk about what they see, using a wide vocabulary.<br>• Learn new vocabulary.<br>• Ask questions to find out more and to check what has been said to them.<br>• Articulate their ideas and thoughts in well-formed sentences.<br>• Describe events in some detail.<br>• Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.<br>• Use new vocabulary in different contexts.<br>• Describe what they see, hear and feel while they are outside.<br><u>Investigating and Observing</u><br>• Use all their senses in hands-on exploration of natural materials.<br>• Explore how things work.<br>• Explore collections of materials with similar and/or different properties.<br>• Explore the natural world around them. |
| **Year 1 & 2** | <u>Asking and answering questions</u><br>• Use everyday language and simple scientific words to ask or answer simple scientific questions. (Y1)<br>• Suggest ideas, ask simple questions and know that they can be answered in different ways, including simple secondary resources, such as books. (Y2)<br><u>Investigating</u><br>• Follow instructions to complete a simple test, individually or in a group.(Y1)<br>• Do things in the correct order when performing a simple test and begin to recognise when something is unfair.Y2<br><u>Observing</u><br>• Observe objects, materials and living things and describe what they see.Y1<br>• Observe something closely and describe changes over time.Y2<br><u>Equipment and measuring</u><br>• Use simple, non-standard measurements in a practical task.Y1<br>• Use simple equipment, such as hand lenses or egg timers to take measurements, make observations and carry out simple tests.Y2<br><u>Identifying and classifying</u><br>• Sort and group objects, materials and living things, with help, according to simple observational features.Y1 |

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| | • Decide, with help, how to group materials, living things and objects, noticing changes over time and beginning to see patterns.Y2<br>Recording and reporting on findings<br>• Talk about their findings and explain what they have found out. Y1<br>• Gather data, record and talk about their findings, in a range of ways, using simple scientific vocabulary.Y2<br>Analysing data<br>• Use everyday or scientific language to ask/answer questions on given data.Y1<br>• Identify simple patterns and/or relationships, using simple comparative language.Y2<br>Drawing conclusions<br>• Explain, with help, what they think they have found out.Y1<br>• Use simple scientific language to explain what they have found out.Y2 |
| **Year 3 & 4** | Asking and answering questions<br>• Use ideas to pose questions, independently about the world around them. (Y3)<br>• Suggest relevant questions and know that they could be answered in a variety of ways, including using secondary sources, such as ICT. Answer questions using straight forward scientific evidence.(Y4)<br>Investigating<br>• Discuss enquiry methods and describe a fair test.Y3<br>• Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables.Y4<br>Observing<br>• Make decisions about what to observe during an investigation.Y3<br>• Make systematic and careful observations.Y4<br>Equipment and measuring<br>• Take accurate measurements using standard units.Y3<br>• Take accurate measurements using standard units and a range of equipment, including thermometers.Y4<br>Identifying and classifying<br>• Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.Y3<br>• Identify similarities/differences/changes when talking about scientific processes. Use and begin to create simple keys.Y4<br>Recording and reporting on findings<br>• Record their findings using scientific language and present in writing frames, diagrams, tables and charts.Y3<br>• Choose appropriate ways to record and present information, findings and conclusions for different audiences, e.g. displays, oral or written explanations.Y4 |

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| | <u>Analysing data</u><br>• Gather, record and use data in a variety of ways to answer a simple question.Y3<br>• Identify, with help, changes, patterns, similarities and differences in data to help form conclusions. Use scientific evidence to support their findings.Y4<br><u>Drawing conclusions</u><br>• Draw, with help, a simple conclusion based on evidence from an enquiry or observation.Y3<br>• Use recorded data to make predictions, pose new questions and suggest improvements for further enquiries.Y4 |
| **Year 5 & 6** | <u>Asking and answering questions</u><br>• Raise different types of scientific questions, and hypotheses.Y5<br>• Pose/select the most appropriate line of inquiry to investigate scientific questions.Y6<br><u>Investigating</u><br>• Plan a range of scientific enquiries, including comparative and fair tests.Y5<br>• Select and plan the most suitable line of enquiry, explaining which variables need to be controlled and why, in a variety of comparative and fair tests.Y6<br><u>Observing</u><br>• Plan and carry out comparative and fair tests, making systematic and careful observations.Y5<br>• Make their own decisions about which observations to make, using test results and observations to make predictions or set up further comparative or fair tests.Y6<br><u>Equipment and measuring</u><br>• Take measurements using a range of scientific equipment, with increasing accuracy and precision.Y5<br>• Choose the most appropriate equipment in order to take measurements, explaining how to use it accurately.<br>• Decide how long to take measurements for, checking results with additional readings.Y6<br><u>Identifying and classifying</u><br>• Use and develop keys to identify, classify and describe living things and materials.Y5<br>• Identify and explain patterns seen in the natural environment.Y6<br><u>Recording and reporting on findings</u><br>• Record data and results of increasing complexity using scientific diagrams, labels, classification keys, tables, and bar and line graphs.Y5<br>Choose the most effective approach to record and report results, linking to mathematical knowledge.Y6 |