| Manor Hill Progression of Science - Hierarchical Knowledge | | | |
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| **Strands** | **KS1** | **LKS2** | **UKS2 – Taught at Middle School** |
| **Biology** | | | |
| **Living Things and their Habitats** | • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores<br>• explore and compare the differences between things that are living, dead, and things that have never been alive<br>• 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<br>• identify and name a variety of plants and animals in their habitats, including microhabitats<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 | • 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>• recognise that environments can change and that this can sometimes pose dangers to living things. | • 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.<br>• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals<br>• give reasons for classifying plants and animals based on specific characteristics. |
| **Plants** | • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees<br>• identify and describe the basic structure of a variety of common flowering plants, including trees.<br>• observe and describe how seeds and bulbs grow into mature plants<br>• find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. | • identify and describe the functions of different parts of flowering plants: roots, 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>• investigate the way in which water is transported within plants<br>• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal | |
| **Animals, including Humans** | • 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>• 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) | • 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.<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 | • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals.<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 describe the ways in which nutrients and water are transported within animals, including humans |

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| | • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. | • construct and interpret a variety of food chains, identifying producers, predators and prey. | |
| **Physics** | | | |
| **Seasonal Change** | • observe changes across the four seasons<br>• observe and describe weather associated with the seasons and how day length varies. | None | • describe the movement of the Earth, and other planets, relative to the Sun in the solar system<br>• describe the movement of the Moon relative to the Earth<br>• describe the Sun, Earth and Moon as approximately spherical bodies<br>• use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. - Link to Light |
| **Electricity** | None | • identify common appliances that run on electricity<br>• construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers<br>• 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<br>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit<br>• recognise some common conductors and insulators, and associate metals with being good conductors. | • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit<br>• 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<br>• use recognised symbols when representing a simple circuit in a diagram. |
| **Sound** | None | • identify how sounds are made, associating some of them with something vibrating<br>• recognise that vibrations from sounds travel through a medium to the ear<br>• find patterns between the pitch of a sound and features of the object that produced it<br>• find patterns between the volume of a sound and the strength of the vibrations that produced it<br>• recognise that sounds get fainter as the distance from the sound source increases . | |
| **Light** | None | •compare how things move on different surfaces<br>• notice that some forces need contact between two objects, but magnetic forces can act at a distance<br>• observe how magnets attract or repel each other and attract some materials and not others<br>• 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<br>• describe magnets as having two poles<br>• predict whether two magnets will attract or repel each other, depending on which poles are facing. | • recognise that light appears to travel in straight lines<br>• 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<br>• 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<br>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them |
| **Forces and Magnets** | None | | |

| Chemistry | | | |
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| **Everyday Materials** | • distinguish between an object and the material from which it is made<br>•identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials<br>•compare and group together a variety of everyday materials on the basis of their simple physical properties.<br>•identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses<br>•find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | None | • 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 |
| **States of Matter** | None | • compare and group materials together, according to whether they are solids, liquids or gases<br>• 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)<br>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. | •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<br>•know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution<br>• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating<br>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes |
| **Rocks** | None | • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties<br>•describe in simple terms how fossils are formed when things that have lived are trapped within rock<br>• recognise that soils are made from rocks and organic matter. | |
| **Working Scientifically – Enquiry Types** | | | |
| **Fair Test** | KS1CAT2 (1): Fair Test<br>To work scientifically by performing simple tests to explore questions, (for example what is the best material for an umbrella or for curtains)<br><br>KS1CAT2 (2): Fair Test<br>To work scientifically by performing simple tests to explore the suitability of a variety of everyday materials for particular uses. | KS2CAT3: Fair test<br>Plant an investigation to check the conductive properties of materials, with pupils predicting that metals will allow a circuit to be complete, but the other materials will not. Test the predictions and record in a table.<br><br>KS2CAT3 (2): Fair test | |

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| | | The children will think about what impact different materials make on sounds. They will test which materials are better at letting sound travel through and which materials are better insulators. | |
| **Observe** | KS1CAT3: Observing Changes over time:<br>This strand of working scientifically is knew to the children. It is important they understand that a change is going to happen but we need to revisit it over a longer time period that perhaps just between lessons. | KS2CAT1 (2): Observing a change over time:<br>Use their observations to find out the impact heat has on the evaporation of water. | |
| **Identify, classify and group** | KS1CAT1: Identify, sort and classify:<br>To know that classifying is where you sort objects based on their features and find connections between them.<br>To sort and classify objects/things based on if they are living, dead or have never been alive and justify why. For example, a table has never been alive because it has never done the life processes of moving or breathing whereas a daffodil is alive because it does produce oxygen and it does move as it grows towards light.<br>To sort and classify plants and animals in to habitats that are suitable and provide them with their basic needs.<br>To identify where an animal fits in the food chain.<br><br>KS1CAT2 (1): Identify, sort and classify<br>To sort and classify objects and materials based on their properties, for example hard/soft, shiny/dull, rough/smooth, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent and justify why.<br><br>KS1CAT2 (2): Identify, sort and classify<br>To sort and classify objects and materials depending on if they can be changed by squashing, bending, twisting and stretching.<br><br>KS1CAT3: Identifying, grouping and classifying<br>To revisit that classifying is where you sort objects based on their features and find connections between them. This strand of working scientifically has already been covered in KS1.CA.T1 when the children grouped living things and also in KS1.CA.T2 when they grouped materials depending on their properties. | KS2CAT1: Identify, sort and classify:<br>To identify and study plants and animals in their habitats and understand that habitats change throughout the year.<br>To sort and classify a variety of living things (animals and plants).<br>To classify depending on characteristics such as vertebrates and invertebrates, can fly, can't fly, can swim, can't swim e.tc<br><br>KS2CAT1 (2): Identify, sort and classify:<br>To sort and classify different objects/materials in to solids, liquids or gases. Understand that they change through heating and cooling and that some objects can change back and others stay in the state they were changed in to.<br><br>KS2CAT2: Identify and classify:<br>Children will be introduced to the main body parts (some of which they will know from KS1) associated with the skeleton and muscles and find out what their functions are. Children could compare the human skeleton/muscles with another animal (fish, bird or mammal (whale, tiger)) thinking about how it helps protect, support and move the body.<br><br>KS2CAT2 (2): Identifying, classifying and grouping<br>Children will identify different animals and plants and why they go in that particular order in the food chain. Children will think about classifying animals and plants in to producers/consumers/predators and prey. | |

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| **Pattern Seek** | | <u>KS2CAT2 (2): Pattern seeking</u><br>Get the children to think about what patterns they can see. Children will understand that plants always have to start the food chain and usually bigger animals such as predators come at the end. Children will understand that food chains can be linked to habitats and where you would find different animals.<br><br><u>KS2CAT3: Pattern Seeking</u><br>Explore using the different components in the circuits. For example, does the brightness alter depending on how many batteries or lightbulbs are in the circuit.<br><br><u>KS2CAT3 (2): Pattern Seeking</u><br>Children will explore and demonstrate how sound travels through different mediums. For example, they can scratch a desk and listen to the sound through the air and then place your ear on the desk and listen again to see if there are any patterns between solid and gas (air). They will observe what happens when you tighten the string of a guitar. The tighter the string (the shorter the length) the higher the pitch. Tap a drum using different amounts of pressure to see if there is a pattern between strength and volume or pitch. The more force exerted, the louder the sound. | |
| **Research** | | <u>KS2CAT1: Research:</u><br>Find out about things that can harm our environment both human and physical. Understand what impacts the environment which is out of our control. Research ways in which we harm the environment and what steps we can do to prevent this.<br><br><u>KS2CAT2: Research:</u><br>Children will research different food groups and how they keep us healthy.<br><br><u>KS2CAT2 (2): Research:</u><br>Children would be researching which teeth to use when eating different foods and researching which parts of the body play what role/function within the digestive system. Compare the teeth of humans with carnivores and herbivores. Know that carnivores eat only meat. Their teeth have more canines as they will rip and tear food more. e.g. Lion's teeth. Know that herbivores eat only plant life. Their teeth have more molars as they grind and break down vegetation more. e.g Zebra's teeth. Know that humans are | |

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| | | omnivores and have a more balanced diet of plants and animals. (this links to prior topics).<br><br>. | |
| **Enquiry Skills** | | | |
| **Asking questions** | <u>KS1CAT1:</u><br><br>How will I be a scientist?<br>• Ask questions: about different habitats and research animals that live in each one before sorting them.<br><br><u>KS1CAT2 (1):</u><br><br>How will I be a scientist?<br>• Ask questions: about the materials being sorted.<br><br><u>KS1CAT2 (2):</u><br><br>How will I be a scientist?<br>• Ask questions: ask about which materials would be suitable for the specific question and select sensible materials to test.<br><br><u>KS1CAT3:</u><br><br>How will I be a scientist?<br>• Ask questions: around local trees and plants in our school area and whether they might be deciduous or evergreen.<br><br><u>KS1CAT3:</u><br><br>How will I be a scientist?<br>• Ask questions: about how different plants grow and plants that could be found in my local environment. | <u>KS2CAT1:</u><br><br>How will I be a scientist?<br>• Ask questions: about environments and habitats we know already know about. What habitats/environments do we have in our local area that you have seen that have been impacted by nature or humans.<br><br><u>KS2CAT1 (2):</u><br><br>How will I be a scientist?<br>• Ask questions: about different materials and objects and which category they fall in to. Can objects/materials change state and then change back?<br><br><u>KS2CAT2:</u><br><br>How will I be a scientist?<br>• Ask questions: about what different food groups provide our body with and what can happen if we eat too much of one type of food.<br><br><u>KS2CAT2:</u><br><br>How will I be a scientist?<br>• Ask questions: about what do the different bones and muscles do for our bodies.<br>• Predict: which parts of the skeleton and muscles you think animals might have that humans have.<br>• Record: the similarities and differences between a human skeleton and another animal.<br><br><u>KS2CAT2 (2):</u><br><br><u>How will I be a scientist?</u><br>• Ask questions: discussion as to why and how your mouth/teeth would work to eat that particular food. Thinking about the process | |

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| | | and why you have to digest food in that order through the different body parts.<br><br><u>KS2CAT3 (2):</u><br><br>How will I be a scientist?<br>• Ask questions: about which materials we know and could use to see if they are insulators for sound.<br><br><u>KS2CAT3 (2):</u><br><br>How will I be a scientist?<br><br>• Ask questions: about whether sounds, volume and pitch can be impacted depending on how the object is used or what medium the sound is travelling through. | |
| **Making predictions** | <u>KS1CAT2 (1):</u><br><br>How will I be a scientist?<br>• Predict: make opinions based on identifying the properties of the materials. | <u>KS2CAT2:</u><br><br>How will I be a scientist?<br>• Predict: which parts of the skeleton and muscles you think animals might have that humans have.<br><br><u>KS2CAT2 (2):</u><br><br><u>How will I be a scientist?</u><br>• Predict: Which teeth would you use for that particular food? What do you think that part of the body does in the process of digestion.<br><br><u>KS2CAT3:</u><br><br>How will I be a scientist?<br>• Predict- which materials they think will conduct electivity and which materials are insulators. | |
| **Setting up tests** | <u>KS1CAT2 (1):</u><br><br>How will I be a scientist?<br>• Set up: test the materials for an investigation and then group the materials based on the findings. | <u>KS2CAT3:</u><br><br>How will I be a scientist?<br>• Set up: complete a fair test by using the same components for each material that is tested.<br><br><u>KS2CAT3 (2):</u> | |

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| | <u>KS1CAT2 (2):</u><br><br>How will I be a scientist?<br>• Set up: my enquiry to test which materials would be suitable for the job.<br><br><u>KS1CAT3:</u><br>How will I be a scientist?<br>• Set up: to investigate the best growing conditions for a plant (seeds and bulbs)<br>• Set up: a comparative test to show that plants need light and water to stay healthy (seeds and bulbs do not need as much light as they store food inside them) | How will I be a scientist?<br>• Plan: a fair test thinking about testing different materials and seeing if sound can pass through and how the different materials effect the volume. Ensure the test is made fair by using the same sound and its volume. | |
| **Observing and measuring** | <u>KS1CAT1:</u><br><br>How will I be a scientist?<br>• Observe: local habitats and find microhabitats and consider what animals need that makes this habitat appropriate for them.<br><br><u>KS1CAT2 (1):</u><br>How will I be a scientist?<br>• Observe: sort materials into groups based on what they are made out of or material properties.<br><br><u>KS2CAT2 (2):</u><br><br>How will I be a scientist?<br>• Observe: how the different materials change through squashing, bending, twisting and stretching and then group them and classify their properties.<br><br><u>KS1CAT3:</u><br><br><u>How will I be a scientist?</u><br>• Observe: throughout the year/terms whether these trees change or remain the same. See what plants grow on our field and the areas surrounding our school.<br><br><u>KS1CAT3:</u><br><u>How will I be s scientist?</u><br>• Observe: watch how the plants grows over time. | <u>KS2CAT1</u><br>How will I be a scientist?<br>• Observe: animals and plants to categorise them into areas of a classification key.<br><br><u>KS2CAT1 (2):</u><br>How will I be a scientist?<br>• Observe: think about which category they fall in to based on how their particles move.<br><br><u>KS2CAT1 (2):</u><br>How will I be a scientist?<br>• Observe: evaporation over a period of time and investigate the effect of temperature.<br><br><u>KS2CAT3:</u><br>How will I be a scientist?<br><br>• Observe: what happens when different components are added or taken away from the circuit.<br><br><u>KS2CAT3 (2):</u><br><br>How will I be a scientist?<br><br>• Observe: how the sound changes when you together or loosen string on instruments or how the sound changes when it travels through different mediums.<br>• Measure: use a datalogger to measure the volume of the sound in decibels. | |

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| **Recording data** | KS1CAT1:<br><br>How will I be a scientist?<br>• Record and predict: the knowledge about microhabitats and predict other animals that might be found there and contrast this with animals you wouldn't find in that habitat due to the conditions. For example, ants like dark spaces under rocks and logs whereas a bumble bee would be found in hive or on flower petals out in the open for pollination and because they can fly.<br><br>KS1CAT2 (2):<br><br>How will I be a scientist?<br>• Record: the findings of which materials change.<br><br>KS1CAT2 (2):<br><br>How will I be a scientist?<br>• Record: record data in a simple chart or graph. | KS2CAT1:<br>How will I be a scientist?<br>• Record/communicating results: make a guide to identify local plants and animals<br><br>KS2CAT1 (2):<br>How will I be a scientist?<br>• Record: put the findings in to a chart or graph.<br><br>KS2CAT1 (2):<br><br>How will I be a scientist?<br>• Record: record regular data about the quantity of water remaining at regular intervals.<br>• Interpret: the results and make conclusions about the effect of temperature.<br><br>KS2CAT2:<br><br>How will I be a scientist?<br>• Record: the similarities and differences between a human skeleton and another animal.<br><br>KS2CAT2 (2):<br><br>How will I be a scientist?<br>• Record: simple food chains and label their classification.<br><br>KS2CAT2 (2):<br><br>How will I be a scientist?<br>• Recording: food chains in their books with labels of classifications<br><br>KS2CAT3:<br>How will I be a scientist?<br><br>• Record: what has been discovered around the power of batteries and the number of components in a circuit- use pictures and writing to explain.<br><br>KS2CAT3:<br><br>How will I be a scientist? | |

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| | | • Record: which materials worked and turned the lightbulb on and which ones didn't- did they match the predictions. | |
| **Interpretation and communicating results** | <u>KS1CAT2 (2):</u><br><br>How will I be a scientist?<br>• Report: the findings explaining why that material would be chosen because of how it changes.<br><br><u>KS1CAT2 (2):</u><br><br>How will I be a scientist?<br>• Report: explain what they have found out and use findings to think about other materials and the suitability for different objects. | <u>KS2CAT1:</u><br><br>How will I be a scientist?<br>• Report: share ways in which we can prevent harm to our environment and encourage others to do the same.<br><br><u>KS2CAT1 (2):</u><br>How will I be a scientist?<br>• Interpret: the results and make conclusions about the effect of temperature.<br><br><u>KS2CAT2:</u><br><br>How will I be a scientist?<br>• Communicating results: children will design meals based on what they have found out in the research stage.<br><br><u>KS2CAT2 (2):</u><br><br>How will I be a scientist?<br>• Communication result/evaluate: explain why the animals and plants go in that particular order and think about explaining why those animals have been chosen- would you find them all in the same habitat?<br><br><u>KS2CAT3 (2):</u><br><br>How will I be a scientist?<br><br>• Report: analyse the results and explain how thickness of the insulator plays a part in the volume of the sound. | |
| **Evaluating** | <u>KS1CAT3:</u><br><u>How will I be s scientist?</u><br>• Evaluate: use the results to interpret what the best conditions are to grow a plant. | <u>KS2CAT1:</u><br>How will I be a scientist?<br>• Evaluate: why certain animals and plants have had to go in those groups and make links between, noticing similarities and differences and also thinking about habitats for them. | |

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| | | <u>KS2CAT2 (2):</u><br><br><u>How will I be a scientist?</u><br>• Evaluate: children will explain why certain animals go in different orders and what the arrows mean within the food chain. | |

| Biology | Physics | Chemistry |
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| Manor Hill Science Curriculum Overview | | | | | | |
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| | **Autumn Term 1** | **Autumn Term 2** | **Spring Term 1** | **Spring Term 2** | **Summer Term 1** | **Summer Term 2** |
| **KS1 Cycle A** | Living Things and their Habitats | | Materials (y1) | Material (y2) | Plants (y1) | Plants (y2) |
| **KS1 Cycle B** | Animals, including **Humans** (y1) | Animals, including **Humans** (y2) | **Animals**, including Humans (y1) | **Animals**, including Humans (y2) | Seasonal Change | |
| **LKS2 Cycle A** | Living Things and their Habitats | States of Matter | Animals, including Humans (y3) | Animals, including Humans (y4) | Electricity | Sound |
| **LKS2 Cycle B** | Rocks | Light | Forces and Magnets | | Plants | |

| Manor Hill Progression of Vocabulary | | |
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| **Strands** | **KS1** | **LKS2** |
| **Biology** | | |
| **Living Things and their Habitats** | | |
| **Plants** | | |
| **Animals, including Humans** | | |
| **Physics** | | |
| **Seasonal Change** | | None |
| **Electricity** | None | |
| **Sound** | None | |
| **Light** | None | |
| **Forces and Magnets** | None | |
| **Chemistry** | | |
| **Everyday Materials** | | None |
| **States of Matter** | None | |
| **Rocks** | None | |
| **Working Scientifically** | | |
| **Working Scientifically** | | |