

Science Subject Progression Map

Investigation- The following are to be taught throughout the year when conducting investigations. As several of these areas will be covered in each investigation they have not been allocated to a specific topic.

| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Investigation Questioning Disciplinary Knowledge | Learning Intention | Ask simple scientific questions. | Ask and answer scientific questions about the world around them. | Ask questions about the world around them and explain that they can be answered in different ways. | Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them. | Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them. | Ask and answer deeper and broader scientific questions about the local and wider world that build on and extend their own and others' experiences and knowledge. |
| | Knowledge | Question words include what, why, how, when, who and which. | Questions can help us find out about the world. | Questions can help us find out about the world and can be answered in different ways. | Questions can help us find out about the world and can be answered using scientific enquiry. | Questions can help us find out about the world and can be answered using a range of scientific enquiries. | Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation. |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Investigation Measurement Disciplinary Knowledge | Learning Intention | With support, use simple equipment to measure and make observations. | Use simple equipment to measure and make observations. | Take measurements in standard units, using a range of simple equipment. | Take accurate measurements in standard units, using a range of equipment. | Take increasingly accurate measurements in standard units, using a range of chosen equipment. | Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment. |
| | Knowledge | Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses. | Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels. | Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement. | Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres). | Specialised equipment is used to take measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres). | Specialised equipment is used to take accurate measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C) and measuring tapes (millimetres, centimetres, metres). |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Investigation Investigate Disciplinary Knowledge | Learning Intention | With support, follow instructions to perform simple tests and begin to talk about what they might do or what might happen. | Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions. | Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. | Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. | Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding. | Plan and carry out a range of enquiries, including writing methods, identifying and controlling variables, deciding on equipment and data to collect and making predictions based on prior knowledge and understanding. |
| | Knowledge | Simple tests can be carried out by following a set of instructions. | Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation. | Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge. | Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant. | A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding. | A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding. |

| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Investigation Observation Disciplinary Knowledge | Learning Intention | Observe objects, materials, living things and changes over time, sorting and grouping them based on their features. | Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. | Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. | Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections. | Within a group, decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. | Independently decide which observations to make, when and for how long and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. |
| | Knowledge | Objects, materials and living things can be looked at and compared. | Objects, materials and living things can be looked at, compared and grouped according to their features. | An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. | An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time. | An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time. | An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons. |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Investigation Report and conclude Disciplinary Knowledge | Learning Intention | Talk about what they have done and say, with help, what they think they have found out. | Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. | Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. | Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions. | Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions. | Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further questions and make predictions for what they might observe. |
| | Knowledge | The results are information that has been found out from an investigation. | The results are information that has been found out from an investigation and can be used to answer a question. | Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected. | Results are information, such as data or observations that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected. | The results are information, such as measurements or observations that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected. | The results are information, such as measurements or observations that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence. |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Investigation Gather and record data Disciplinary Knowledge | Learning Intention | With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams). | Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. | Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. | Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs). | Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). | Choose an appropriate approach to recording accurate results, including scientific diagrams, labels, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge. |
| | Knowledge | Data can be recorded and displayed in different ways, including tables, pictograms and drawings. | Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. | Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions. | Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams. | Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams. | Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams. |

| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Plants | Learning Intention Substantive Knowledge | <ul style="list-style-type: none"> - Identify, compare, group and sort a variety of common plants, including deciduous and evergreen trees, based on observable features. - Label and describe the basic structure of a variety of common plants. | <ul style="list-style-type: none"> - Describe how plants need water, light and a suitable temperature to grow and stay healthy. - Observe and describe how seeds and bulbs change over time as they grow into mature plants. | <ul style="list-style-type: none"> - Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers). - Investigate how water is transported within plants. - Describe the requirements of plants for life and growth (air, light, water, nutrients and room to grow) and how they vary from plant to plant. - Draw and label the life cycle of a flowering plant. | | | |
| | Knowledge | <ul style="list-style-type: none"> - Plants are living things. Common plants include the daisy, daffodil and grass. Trees are large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees. Trees that keep their leaves all year round are called evergreen trees. <i>Science week</i> - The basic plant parts include root, stem, leaf, flower, petal, fruit, seed and bulb. Trees have a woody stem called a trunk. <i>Science week</i> | <ul style="list-style-type: none"> - Plants need water, light and a suitable temperature to grow and stay healthy. Without any one of these things, they will die. <i>Science week</i> - Plants grow from seeds and bulbs. Seeds and bulbs need nutrients from soil, water and warmth to start growing (germinate). As the plant grows bigger, it develops leaves and flowers. <i>Science week</i> | <ul style="list-style-type: none"> - The plant's roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants. <i>Through the ages</i> - Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem. <i>Through the ages</i> - Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have different needs depending on their habitat. <i>Through the ages</i> | | | |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Animals including humans | Learning Intention Substantive Knowledge | <ul style="list-style-type: none"> - Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds and mammals, based on observable features. - Group and sort a variety of common animals based on the foods they eat. - Label and describe the basic structure of a variety of common animals. - Draw and label the main parts of the human body and say which body part is associated with which sense. | <ul style="list-style-type: none"> - Explain how animals, including humans, need water, food, air and shelter to survive. - Notice that animals have offspring. | <ul style="list-style-type: none"> - Compare and contrast the diets of different animals. - Describe how humans need the skeleton and muscles for support, protection and movement. - Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton). | <ul style="list-style-type: none"> - Describe the purpose of the digestive system, its main parts and each of their functions. - Identify the four different types of teeth in humans and other animals, and describe their functions. - Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time. | <ul style="list-style-type: none"> - Describe the changes as humans develop from birth to old age. - Describe the life process of reproduction in some plants and animals. | <ul style="list-style-type: none"> - Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood. - Explain that the circulatory system in animals transports oxygen, water and nutrients around the body. |

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| | | - Describe how to care for plants and animals, including pets. | | | | | |
| | Knowledge | <p>- Animals are living things. Animals can be sorted and grouped into six main groups: fish, amphibians, reptiles, birds, mammals and invertebrates. <i>(paws, claws and whiskers)</i></p> <p>- Carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants. <i>((Dinosaur planet, Paws, claws and whiskers)</i></p> <p>- Different animal groups have some common body parts, such as eyes and a mouth, and some different body parts, such as fins or wings. <i>(Dinosaur planet, Paws, claws and whiskers,)</i></p> <p>- The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. The five senses are hearing, sight, smell, taste and touch. Ears are used for hearing, eyes are used to see, the nose is used to smell, the tongue is used to taste and skin gives the sense of touch. <i>Paws, claws and Whiskers</i></p> <p>- <i>Living things need to be cared for in order for them to survive. They need water, food, warmth and shelter. (Paws, claws and whiskers)</i></p> | <p>- Animals have offspring that grow into adults. Different animals have different stages of growth or life cycles. <i>(Wiggle and crawl)</i></p> <p>- Animals including humans need water, food, air and shelter to survive. Their habitat must provide all these things. <i>(Wiggle and crawl)</i></p> | <p>- Humans have a skeleton and muscles for movement, support and protecting organs. Major bones in the human body include the skull, ribs, spine, humerus, ulna, radius, pelvis, femur, tibia and fibula. Major muscle groups in the human body include the biceps, gastrocnemius, latissimus dorsi and pectorals. <i>Emperors and Empires</i></p> | <p>- The digestive system is responsible for digesting food and absorbing nutrients and water. The main parts of the digestive system are the mouth, oesophagus, stomach, small intestines, large intestines and rectum. The mouth starts digestion by chewing food and mixing it with saliva. The oesophagus transports the chewed food to the stomach, where it mixes with stomach acid and gets broken down into smaller pieces. In the small intestine, nutrients from the food are absorbed by the body. In the large intestine, water is absorbed by the body. The remaining undigested waste is stored in the rectum before excretion through the anus. <i>Traders and Raiders</i></p> <p>- There are four different types of teeth: incisors, canines, premolars and molars. Incisors are used for cutting. Canines are used for tearing. Premolars and molars are used for grinding and chewing. Carnivores, herbivores and omnivores have characteristic types of tooth. Herbivores have many large molars for grinding plant material. Carnivores have large canines for killing and tearing meat. <i>Traders and Raiders</i></p> <p>- Food chains show what animals eat within a habitat and how energy is passed on over time. All food chains start with a producer, which is typically a green plant. The producer is eaten by a primary consumer (prey), which is eaten by a secondary consumer (prey), which is eaten by a tertiary consumer. All food chains end with a top or apex predator. Changes within a food chain, such as an abundance or lack of one food type, have an impact on the entire food chain. <i>(Blue abyss)</i></p> | <p>- Humans go through characteristic stages as they develop to old age. These stages include baby, infant, toddler, child, adolescent, young adult, adult and senior citizen. Puberty is the transition between childhood and adulthood. <i>SRE</i></p> <p>Population changes in a habitat can have significant consequences for food chains and webs. <i>(Beast creator)</i></p> | <p>- The circulatory system includes the heart, blood vessels and blood. The heart pumps blood through the blood vessels and around the body. There are three types of blood vessel: arteries, veins and capillaries. They each have a different-sized hole (lumen) and walls. The blood carries gases (oxygen and carbon dioxide), water and nutrients to where they are needed. The red blood cells carry oxygen and carbon dioxide around the body. The blood also contains white blood cells, which protect the body from infection. <i>(Blood heart)</i></p> <p>- The role of the circulatory system is to transport oxygen, water and nutrients around the body. They are transported in blood and delivered to where they are needed. <i>(Blood heart)</i></p> |
| | Strand | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | Learning Intention | -Observe the local environment throughout the year and ask and | - Compare and group things that are living, dead or have never been alive. | | - Compare, sort and group living things in a variety of ways based | - Compare the life cycles of animals, including a mammal, amphibian, insect and bird. | - Use and construct classification systems to identify |

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| Living things and their habitats | Substantive Knowledge | answer questions about living things and seasonal change. -Describe, following observation, how plants and animals change over time. | - Describe a range of local habitats and habitats beyond their locality (rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there. - Identify and name a variety of plants and animals in a range of habitats and microhabitats. - Interpret and construct simple food chains to describe how living things depend on each other as a source of food. | | on observable features and behaviour. - Describe how environments can change due to human and natural influences and the impact this can have on living things. | - Describe the life process of reproduction in some plants and animals. | animals and plants from a range of habitats. - Classify living things into groups according to common observable characteristics and based on similarities and differences. - Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system. -Compare the living things in two contrasting areas of a habitat (top vs bottom of a hill, full sun vs shade, exposed location vs sheltered location or well-trodden path vs unused area). |
| | Knowledge | -The local environment is a habitat for living things and can change during the seasons. <i>Paws, Claws and Whiskers</i> -All living things (plants and animals) change over time as they grow and mature. <i>(Dinosaur planet, Paws, Claws and Whiskers)</i> | - Living things are those that are alive. Dead things are those that were once living but are no longer. Some things have never been alive. <i>Coastline</i> - Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. All living things live in a habitat to which they are suited and it must provide everything they need to survive. <i>Wriggle and Crawl</i> - A habitat is a place where a living thing lives. A microhabitat is a very small habitat. <i>(Wriggle and crawl)</i> - Food chains show how living things depend on one another for food. All food chains start with a plant, followed by animals that either eat the plant or other animals. <i>(wriggle and crawl)</i> | | - Scientists classify living things according to shared characteristics. Animals can be divided into six main groups: mammals, reptiles, amphibians, birds, fish and invertebrates. These groups can be further subdivided. Classification keys are a scientific tools that aid the identification of living things. <i>(Blue abyss)</i> - Humans can affect habitats in negative ways, such as litter, pollution and land development, or positive ways, such as garden ponds, bird boxes and wildflower areas. <i>(Misty mountain, winding river)</i> | - A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death. Mammals' life cycles include the stages: embryo, baby, adolescent and adult. Amphibians' life cycles include the stages: egg, larva (tadpole), adolescent and adult. Some insects' (butterflies, beetles and bees) life cycles include the stages: egg, larva, pupa and adult. Birds' life cycles include the stages: egg, baby, adolescent and adult. <i>(Beast creator)</i> - Reproduction is the process of producing offspring and is essential for the continued survival of a species. There are two types of reproduction: sexual and asexual. Sexual reproduction involves two parents (one female and one male) and produces offspring that are different from the parents. Asexual reproduction involves one parent and produces offspring that is identical to the parent. <i>Sow, Grow, Farm</i> | - Classification keys help us identify living things based on their physical characteristics. <i>Frozen Kingdoms</i> - Scientists classify living organisms into broad groups according to their characteristics. Vertebrates are an example of a classification group. There are a number of ranks, or levels, within the biological classification system. The first rank is called a kingdom, the second a phylum, then class, order, family, genus and species. <i>(Frozen Kingdoms)</i> - Living things are classified into groups, according to common observable characteristics and based on similarities and differences. <i>(Frozen Kingdoms)</i> |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Evolution and inheritance | Learning Intention | | | | | | Explain that living things have changed over time, using specific examples and evidence. -Describe some significant changes that have happened on Earth and the evidence, such as fossils, that support this. -Identify that living things produce offspring of the same |

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| | Substantive Knowledge | | | | | | <p>kind, although the offspring are not identical to either parent.</p> <ul style="list-style-type: none"> -Describe how animals and plants can be bred to produce offspring with specific and desired characteristics (selective breeding). -Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that adaptations may lead to evolution. |
| | Knowledge | | | | | | <ul style="list-style-type: none"> -Scientists compare fossilised remains from the past to living species that exist today to hypothesise how living things have evolved over time. <p><i>Science Week</i></p> <ul style="list-style-type: none"> -Animals that sexually reproduce generate new offspring of the same kind by combining the genetic material of two individuals. Each offspring inherits two of every gene, one from the female parent and one from the male parent. <p><i>Science Week</i></p> <ul style="list-style-type: none"> -Animals and plants can be bred to produce offspring with specific and desired characteristics. This is called selective breeding. Examples include cows that produce large quantities of milk or crops that are disease-resistant. <p><i>Science Week</i></p> <ul style="list-style-type: none"> -An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche. Adaptations evolve by natural selection. Favourable traits help an organism survive and pass on their genes to subsequent generations. <p><i>Science week</i></p> |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Materials | <p>Learning Intention</p> <p>Substantive Knowledge</p> | <ul style="list-style-type: none"> - Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock. - Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof and magnetic or non-magnetic. | <ul style="list-style-type: none"> - Compare the suitability of a range of everyday materials for particular uses. - Describe how some objects and materials can be changed and how these changes can be desirable or undesirable. | <ul style="list-style-type: none"> - Compare and group rocks based on their appearance, properties or uses. - Describe simply how fossils are formed, using words, pictures or a model. - Investigate soils from the local environment, making comparisons and identifying features. | <ul style="list-style-type: none"> - Group and sort materials into solids, liquids or gases. - Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius ($^{\circ}\text{C}$) at which materials change state. | <ul style="list-style-type: none"> -Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. -Explain, following observation that some substances (solutes) will dissolve in liquid (solvents) to form a solution and the solute can be recovered by evaporating off the solvent. | |

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| | | - Compare and group materials in a variety of ways, such as based on their physical properties; being natural or man-made and being recyclable or non-recyclable. | | | | -Separate mixtures by filtering, sieving and evaporating. -Describe, using evidence from comparative or fair tests, why a material has been chosen for a specific use. -Identify, demonstrate and compare reversible and irreversible changes. | |
| | Knowledge | - A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric. <i>(Moon zoom)</i> - Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof; magnetic or non-magnetic. <i>(Moon zoom)</i> - Materials can be grouped according to their properties. <i>(Moon zoom)</i> | - A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Many materials are used for more than one purpose, such as metal for cutlery and cars. <i>Magnificent Monarchs</i> - Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay. <i>Magnificent Monarchs</i> | - There are three different rock types: sedimentary, igneous and metamorphic. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Examples include sandstone and limestone. Igneous rocks are made from cooled magma or lava. They usually contain visible crystals. Examples include pumice and granite. Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth's crust or squashed by the movement of the Earth's tectonic plates. <i>(Rocks, relics and rumbles)</i> - Fossils form over millions of years and are the remains of a once-living organism, preserved as rock. Scientists can use fossils to find out what life on Earth was like in prehistoric times. Fossils form when a living thing dies in a watery environment. The body gets covered by mud and sand and the soft tissues rot away. Over time, the ground hardens to form sedimentary rock and the skeletal or shell remains turn to rock. <i>(Rocks, relics and rumbles)</i> - Soils are made from tiny pieces of eroded rock, air and organic matter. There are a variety of naturally occurring soils including, clay, sand and silt. Different areas have different soil types. <i>(Rocks, relics and rumbles)</i> | - Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay. Liquids move around (flow) easily and are difficult to hold. Liquids take the shape of the container in which they are held. Examples of liquids include water, juice and milk. Gases spread out to fill the available space and cannot be held. Air is a mixture of gases. <i>(Transformations)</i> - Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. The temperature at which materials change state varies depends on the material. Water changes state from solid (ice) ⇌ liquid (water) at 0°C and from liquid (water) ⇌ gas (water vapour) at 100°C. The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation. <i>(Transformations)</i> | -Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. <i>Sow, Grow, Farm</i> -Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating. <i>Sow, Grown, Farm</i> -Some mixtures can be separated by filtering, sieving and evaporating. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. Evaporating can be used to separate dissolved solids from liquids. <i>Sow, Grow, Farm</i> -A material's properties dictate what it can be used for. For example, cooking pans are made from metal, which is a good thermal conductor, allowing heat to quickly transfer from the hob to the contents of the pan. <i>Sow, Grow, Farm</i> -Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions. <i>Stargazers</i> | |
| | Strand | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Seasonal changes And the water cycle | Learning Intention Substantive Knowledge | - Observe changes across the four seasons. - Observe and describe how day length changes across the year. - Observe and describe different types of weather -Investigate weather using toys, models or simple equipment. | -Describe typical UK seasonal weather patterns. | | - Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation. | | |

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| | Knowledge | <p>- There are four seasons: spring, summer, autumn and winter. Certain events and weather patterns happen in different seasons. <i>Ongoing investigation - start Sept finish July</i></p> <p>- Day length (the number of daylight hours) is longer in the summer months and shorter in the winter months. <i>(Maths Meeting)</i></p> <p>- Different types of weather include sun, rain, hail, wind, snow, fog, lightning, storm and cloud. The weather can change daily and some weather types are more common in certain seasons, such as snow in winter. <i>Ongoing investigation - start Sept finish July</i></p> <p>- Simple equipment can be used for measuring weather, such as measuring temperature with a thermometer; identifying wind direction and force with a wind sock or measuring rainfall with a rain gauge. <i>Ongoing investigation - start Sept finish July</i></p> | <p>-The UK has typical weather in each of the seasons. For example, winter is cold and sometimes frosty, whereas summer is warm and sometimes sunny. <i>(Ongoing during maths meetings)</i></p> | | <p>- The water cycle has four stages: evaporation, condensation, precipitation, collection. Water in lakes, rivers and streams is warmed by the Sun, causing the liquid water to evaporate and rise into the air as water vapour. As the water vapour rises, it cools and condenses to form liquid water droplets in clouds. The clouds become full of water, until the water falls back to the ground as precipitation (rain, hail, snow and ice). The fallen water collects back in lakes, rivers and streams. Evaporation and condensation are caused by temperature changes. <i>(Misty mountain, windy river)</i></p> | | | |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | |
| Forces and magnets | Learning Intention Substantive Knowledge | | | <p>- Compare how objects move over surfaces made from different materials.</p> <p>- Explain that an object will not move unless a push or pull (force) is applied, describing forces in action and whether the force requires direct contact or whether the force can act at a distance (magnetic force).</p> <p>- Compare and group materials based on their magnetic properties.</p> <p>- Investigate and compare a range of magnets (bar, horseshoe and floating) and explain that magnets have two poles (north and south) and that opposite poles attract each other, while like poles repel each other.</p> | | <p>-Compare and describe, using a range of toys, models and natural objects, the effects of water resistance, air resistance and friction.</p> <p>-Explain that objects fall to Earth due to the force of gravity.</p> <p>- Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects.</p> | | |
| | Knowledge | | | <p>- Friction is a force between two surfaces as they move over each other. Friction slows down a moving object. Smooth surfaces usually generate less friction than rough surfaces. <i>Science week</i></p> | | <p>-Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects. These forces can be useful, such as bike brakes and parachutes, but sometimes we need to minimise their effects, such as</p> | | |

| Strand | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Light and sound | | | <ul style="list-style-type: none"> - An object will not move unless a pushing or pulling force is applied. Some forces require direct contact, whereas other forces can act at a distance, such as magnetic force. <i>Science week</i> - Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. The metal iron is magnetic. <i>Science week</i> - Magnets have two poles (north and south). Opposite poles (north and south) attract each other, while like poles (north and north, or south and south) repel each other. <i>Science week</i> | | <p>streamlining boats and planes to move through water or air more easily, and using lubricants and ball bearings between two surfaces to reduce friction. <i>Science week</i></p> <p>-Gravity is a force of attraction. Anything with a mass can exert a gravitational pull on another object. The Earth's large mass exerts a gravitational pull on all objects on Earth, making dropped objects fall to the ground. <i>(Stargazers)</i></p> <p>-Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. A mechanical advantage is a measurement of how much a simple machine multiplies the force that we put in. The bigger the mechanical advantage, the less force we need to apply. <i>Science week</i></p> | |
| Learning Intention | | | <ul style="list-style-type: none"> -Describe dark as being the absence of light and that we need light to be able to see. -Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object. -Find patterns in the way shadows change during the day. | <ul style="list-style-type: none"> - Explain how sounds are made and heard using diagrams, models, written methods or verbally. - Compare and find patterns in the pitch of a sound, using a range of equipment, such as musical instruments. - Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments. - Compare how the volume of a sound changes at different distances from the source. | | <ul style="list-style-type: none"> Identify that light travels in straight line -Explain that due to how light travels, we can see things because they give out or reflect light into the eye. -Explain, using words, diagrams or a model, why shadows have the same shape as the objects that cast them and how shadows can be changed. -Describe, using diagrams, how light behaves when reflected off a mirror (plane, convex or concave) and when passing through a lens (concave or convex). -Describe, using scientific language, phenomena associated with light (rainbows, colours on soap bubbles and refraction in a glass of water). |
| Substantive Knowledge | | | | | | |
| Knowledge | | | <ul style="list-style-type: none"> -Dark is the absence of light and we need light to be able to see. <i>Discover Doncaster</i> -A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object. Transparent objects allow light to pass through them and do not create shadows. <i>Discover Doncaster</i> -Shadows change shape and size when the light source moves. <i>Discover Doncaster</i> | <ul style="list-style-type: none"> - When an instrument is played, the air around or inside it vibrates. These vibrations travel as a sound wave. Sound waves travel through a medium, such as air or water, to the ear. <i>Science week</i> - Pitch is how high or low a sound is. Parts of an instrument that are shorter, tighter or thinner produce high-pitched sounds. Parts of an instrument that are longer, looser or fatter produce low-pitched sounds. | | <ul style="list-style-type: none"> -Light travels in straight lines. <i>Hola Mexico</i> -Light sources give out light. They can be natural or artificial. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source or reflected light enter the eye. Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and focuses it on the |

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| | | | | | <p><i>Science week</i> - Volume is how loud or quiet a sound is. The harder an instrument is hit, plucked or blown, the stronger the vibrations and the louder the sound.</p> <p><i>Science week</i> - Sounds are louder closer to the sound source and fainter as the distance from the sound source increases.</p> <p><i>Science week</i></p> | | <p>nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve.</p> <p><i>Hola Mexico</i> -A shadow appears when an object blocks the passage of light. Apart from some distortion or fuzziness at the edges, shadows are the same shape as the object. The distortion or fuzziness depends on the position or type of light source.</p> <p><i>Hola Mexico</i> -Mirrors and lenses are used in a range of everyday objects (telescopes, periscopes, cards and on roads). The human eye has a lens that bends and focuses light on the back of the eye (retina) so that we can see.</p> <p><i>Hola Mexico</i></p> |
| | Strand | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Earth and space | <p>Learning Intention</p> <p>Substantive Knowledge</p> | | | | | <ul style="list-style-type: none"> - Describe or model the movement of the planets in our Solar System, including Earth, relative to the Sun. - Describe or model the movement of the Moon relative to Earth. - Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses. - Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky. | |
| | Knowledge | | | | | <ul style="list-style-type: none"> - The Solar System is made up of the Sun and everything that orbits around it. There are eight planets in our Solar System: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Earth orbits around the Sun and a year (365 days) is the length of time it takes for Earth to complete a full orbit. <i>(Stargazers)</i> - The Moon orbits Earth, completing a full orbit every month (28 days). <i>(Stargazers?)</i> - The Sun, Earth, Moon and other planets and stars are roughly spherical. All planets are spherical because their mass is so large that they have | |

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| | | | | | | <p>their own force of gravity. This force of gravity pulls all of a planet's material towards its centre, which compresses it into the most compact shape - a sphere.</p> <p><i>(Stargazers</i></p> <p>- As Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin. During the day, the Sun appears to move through the sky. However, this is due to the Earth rotating and not the Sun moving. Earth rotates to the east or, if viewed from above the North Pole, it rotates anti-clockwise, which means the Sun rises in the east and sets in the west. As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time.</p> <p><i>(Stargazers</i></p> | |
| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Electricity | Learning Intention | | | | <ul style="list-style-type: none"> - Compare common household equipment and appliances that are and are not powered by electricity. - Construct operational simple series circuits using a range of components and switches for control. - Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell. - Describe materials as electrical conductors or insulators. | | <ul style="list-style-type: none"> - Explain how the brightness of a lamp or volume of a buzzer is affected by the number and voltage of cells used in a circuit. - Compare and give reasons for variations in how components in electrical circuits function (brightness of lamps; volume of buzzers and on or off of switches). - Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components. |
| | Knowledge | | | | <ul style="list-style-type: none"> - Electricity is a type of energy. It is used to power many everyday items, such as kettles, computers and televisions. Electricity can also come from batteries. Batteries eventually | | <ul style="list-style-type: none"> - Voltage is measured in volts (V) and is a measure of the difference in 'electrical energy' between two parts of a circuit. The bigger the voltage, the more electrons are pushed |

| | | | | | <p>run out of power and need to be recycled or recharged. Batteries power devices that can be carried around, such as mobile phones and torches. <i>(Road trip USA</i> - Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control. <i>(Road trip USA,</i> - A series circuit is a simple loop with only one path for the electricity to flow. A series circuit must be a complete loop to work and have a source of power from a battery or cell. <i>(Road trip USA</i> - Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. Common insulators include wood, glass, plastic and rubber. <i>(Road trip USA</i></p> | | <p>through the circuit. The more voltage flowing through a lamp, buzzer or motor, the brighter the lamp, the louder the buzzer and the faster the motor. <i>Childs War</i> - A circuit needs a power source, such as a battery or cell, with wires connected to both the positive and negative terminals. Other components include lamps, buzzers or motors, which an electric current passes through and affects a response, such as lighting a lamp or turning a motor. When a switch is open, it creates a gap and the current cannot travel around the circuit. When a switch is closed, it completes the circuit and allows a current to flow all the way around it <i>Childs War</i> - There are recognised symbols for different components of circuits. <i>Childs War</i></p> |
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| Strand | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Healthy Lifestyle | Learning Intention Substantive Knowledge | | - Describe the importance of a healthy lifestyle, including exercise, a balanced diet and good hygiene. | - Describe food pyramid and what makes a balanced diet | | | - Explain the impact of positive and negative lifestyle choices on their body. |
| | Knowledge | | - A healthy lifestyle includes exercise, good hygiene and a balanced diet. <i>Muck mess and mixtures/ PSHE</i> | - A healthy diet includes different food groups <i>(scrumdiddlyumptious)</i> | | | - Lifestyle choices can have a positive (exercise and eating healthily) or negative (drugs, smoking and alcohol) impact on the body. <i>(Blood heart</i> |