Science Curriculum Progression

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of
excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific
- disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through
- different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Key Ideas: Physics, Chemistry, Biology and Working Scientifically. (i.e. *Collecting Data, Asking Scientific Questions, Using Graphs and Tables, Understanding Fair Testing, Presenting and Interpreting Data, Using Graphs and Tables, Hypothesising, Evaluating and Concluding, Researching).*

Threshold Concepts: Data Collection and Analysis, Animals and Human, Plants and Habitats, Health and Evolution, Electricity and Light, Materials, Rocks and Space, States of Matter, Weather and Water Cycles.

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	KS1		KS2			
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Breath of study Bringing writing to science (BWS)	**Looking at Animals - Habitats -** Identify and name a variety of different animals inc. fish, amphibians, reptiles, birds, carnivores, omnivores and herbivores. Answer questions about animals in their habitats. BWS – Write a story (picture book) on your favourite animal and their habitat. **Plant Detectives -** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. BWS – Write a speech about your favourite tree or flower. What about this plant do you like? **Using our senses -** introduction to the concept of five senses that help them to find out about the world around them and link those senses to particular parts of their body.	**The Apprentice Gardener -** Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. BWS – Rewrite 'Jack and the beanstalk' and describe why and how the beanstalk grew. **Growing up and Taking Care -** Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. BWS – Create a pamphlet for year 1 to explain why being healthy is important. **All Things Bright and Beautiful –** 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. BWS – Write a simple 3-part food chain poem. E.g. Grass – Rabbit - Fox **Marvellous Materials** - Identify and compare the uses of a variety of everyday materials,	**The Power of Forces -** Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. BWS – Write a story about why/how two magnets struggled to play together. **Animals and humans and all living things -** Identify that animals, including humans, need the right types of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some animals have skeletons and muscles for support, protection and movement. BWS – Write a letter to a safari park explaining what your chosen animal would need to stay healthy. **How does your garden grow? -** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.	**Who am I? – Living things and their habitats** **Where does all that food go? –** Recognise that living things can be groups in a variety of ways. Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. BWS – Create a pamphlet for the dentist of how to look after your teeth and what different teeth there are. **Switched on -** Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. BWS – Write a newspaper report on the importance of electricity. **Good Vibrations -** Identify how sounds are made, associating some	**The Circle of Life and reproduction of plants and animals –** 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. Describe the changes as humans develop to old age. BWS – Write a narrative about 'animal friendships and enemies.' **The Earth and beyond** - Describe the movement of the Earth, and other planets, relative to the Sun in the solar system Describe the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon as approximately spherical bodies. BWS – Write a letter to Tim Peake explaining what you have learnt about our solar system and ask him relevant questions. **Feel the force -** Explain that unsupported objects fall towards the Earth because of the force of gravity. Recognise that some mechanisms, including levers, pulleys	**Body Pump and Body Health –** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood 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. BWS – Create a pamphlet for year 5's on the importance of a healthy lifestyle. **Everything changes –** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. BWS – Write a newspaper report on the theory of evolution. **The Nature Library –** Describe how living things are classified into

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	BWS – Make a leaflet to go in a hospital telling people about senses. **Everyday Materials -** Distinguishing between and object and a material from which it is made. Identify and name a variety of everyday materials. BWS – Rewrite '3 little pigs' using different materials.	including wood, metal, plastic, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. BWS – Write a letter to Goldilocks and explain why she might find the different materials in the beds uncomfortable.	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. BWS – Write a poem about the growth of a plant and what it needs to grow. **Can You Lose Your Shadow? -** Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that shadows are formed when the lights from a light source is blocked by a solid object. BWS – Write a story about a child who thinks they lose their shadow at night. **Rock Detectives -** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. BWS – Create a pamphlet on the different types of rock and how they are formed.	of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. BWS – Write a letter to your favourite musician/band explaining what their music sounds like and why. **In a state –** Compare and group materials together, according to whether they are solids, liquids or gases. 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. BWS – Write a story (picture book) for KS1 explaining the water cycle.	and gears, allow a smaller force to have a greater effect. BWS – Create a pamphlet to give to the ancient Egyptians to advise on how they should build the pyramids. **Everyday Materials and Marvellous mixtures -** Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. 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. BWS – Write instructions on the best techniques to use when trying to find nuggets of gold in a river.	broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. BWS – Write a narrative about what micro-organisms need to survive. **Light up your world -** 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. BWS – Write a poem about how light travels and how we see. **Danger! Low voltage –** 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. BWS – Write a letter to EON discussing the importance of electricity and how solar panels/turbines can help our environment.
Gathering and presenting evidence	They will organise any data that they collect using tables and tally charts as appropriate. strong emphasis on children observing closely, identifying and	Children record series of observations using labelled drawings and photographs in diaries. Working scientifically by making careful observations over time.	They will have opportunities to gather data and record and present these in a range of ways. When working scientifically children will	Children will ask and answer questions about teeth, digestion and food chains by carrying out research using secondary sources.	They will consider how rocks are affected by weathering over time and work scientifically to carry out tests to establish the hardness and permeability of different kinds of rocks.	Children will use secondary sources of information with increasing independence in order to find answers to questions about the functions of different

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	classifying, and comparing and contrasting. Perform simple tests to explore questions. Look for simple patterns, for example, about their likes and dislikes.	Observing changes over time, identifying and classifying, and noticing patterns.	compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet. Children will ask and answer their own questions about plants through classifying, observing over time, conducting fair test investigations and using secondary sources.	Children will make detailed observations and learn which features are useful for identification and classification. Children will make careful observations and explain what they show. They will also observe and measure changes over time, first-hand and using secondary sources. They will classify materials and record their sorting using Venn diagrams. They will group and classify teeth by their function and relate this to diet. They will present information in labelled diagrams, lists, sorting diagrams and keys, and will learn to interpret information presented in a key.	They look at scientific ideas from the past and carry out an activity to find evidence to support or refute famous scientists' ideas. They make predictions as a result of carrying out simple activities and go on to plan new investigations.	parts of the circulatory system that they cannot investigate first hand. (This should involve them using quality non-fiction books, web-based material and health education publications).
Exploring and Planning	Each sense is explored by children as they answer a variety of science questions. Compare and describe physical properties of everyday materials.	Observing change over time and comparative tests; there is also identifying and classifying, pattern finding and research using secondary sources (videos). using simple equipment and recording their observations in a range of different ways.	Children will ask and answer their own questions about the human body and diet through classifying, pattern-seeking investigations and by carrying out research using secondary sources. They will carry out comparative and fair tests to investigate the strength of magnets and how objects move on different surfaces. They will consider how rocks are affected by	They will plan and carry out a classifying enquiry, recording findings using tables, Venn and Carroll diagrams and will recognise that generalizations cannot be made from small amounts of evidence. They will have opportunities to carry out comparative and fair tests on different types of toothpaste and to record and present data in a range of ways.	Children plan and carry out comparative and fair tests to answer questions about how and why certain materials are selected and used because of their properties. They do this increasingly independently, recognising and controlling variables where necessary, so that they collect sufficient quality evidence to enable them to answer their science questions.	Children use secondary sources of information to answer questions about how mains electricity is generated. Children ask and propose answers to their own questions about shadow formation as well as exploring quantitatively the formation of shadows. They carry out illustrative practicals to explore phenomena.

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			weathering over time and work scientifically to carry out tests to establish the hardness and permeability of different kinds of rocks.	children will look for patterns between the volume of a sound and the strength of the vibrations that produced it. They will also explore the pitch of a sound and ways in which it can be changed. They will do this by investigating how to make and change the sounds produced in a range of different ways. They will plan and carry out fair tests, learning to identify and control variables and drawing up tables to record their data. This will then be presented as bar or bar line graphs.	children plan and carry out fair test and pattern-seeking investigations, observe carefully, record accurate measurements, and construct different mechanisms.	
Interpreting Results / Evidence	Look for simple patterns, for example, about their likes and dislikes. Children use simple vocabulary to describe their observations and to identify similarities and differences, and group the evidence they collect in different ways, sometimes using criteria provided by their teacher and sometimes developing their own criteria, with support and where appropriate.	Observing changes over time, identifying and classifying, and noticing patterns. children will be classifying materials, carrying out comparative tests for different properties and	When working scientifically children will ask and answer their own questions about light and shadow as well as investigate how some materials block more light than others. They will do this through sorting objects according to how much light they block, as well as through simple shadow investigations. They will make predictions as to whether two magnets will attract or repel each other, depending on which poles are facing. They will identify ways in which rocks are used in the local environment and suggest why the properties of certain	They will group and classify teeth by their function and relate this to diet. They will present information in labelled diagrams, lists, sorting diagrams and keys, and will learn to interpret information presented in a key. They will have the opportunity to set up simple comparative and fair tests, take measurements, including using data loggers, and report on their findings. Children will identify patterns in the data and use these to answer their investigation questions and to make further predictions. When investigating changes of	Identify and name rocks, describing and comparing their observable properties and sorting them using a key. They will identify ways in which rocks are used in the local environment and suggest why the properties of certain rocks make them suitable for particular purposes. There are opportunities to develop graphing skills as well as communication and presentation skills.	Children will use observations and secondary source material to help classify living things, record plants and animals in the school environment and use evidence to support or refute ideas. Children take measurements to record variation in plants and animals; they use scientific models to describe complex processes such as selective breeding and natural selection, they question themselves and their peers on aspects of adaptation, and they develop their skills for evaluating evidence. They develop the idea of explaining and supporting the points

			rocks make them suitable for particular purposes.	state they will use thermometers and data loggers, applying their mathematical knowledge of the measurement of temperature in degrees Celsius and learning to interpret a line graph (data logger trace) of temperature and time.		they make with data and evidence, and consider how confident they feel in the conclusions that they draw, relating them back to predictions that they have made earlier.
Threshold Concepts	**Key concepts:** **BIOLOGY** THE CELLULAR BASIS OF LIFE HEREDITY AND LIFE CYCLES VARIATION, ADAPTATION AND EVOLUTION ORGANISMS AND THEIR ENVIRONMENTS HEALTH AND DISEASE **PHYSICS** MATTER FORCES AND MOTION SOUND, LIGHT AND WAVES ELECTRICITY AND MAGNETISM EARTH IN SPACE **CHEMISTRY** SUBSTANCES AND PROPERTIES	**Key concepts:** **BIOLOGY** THE CELLULAR BASIS OF LIFE HEREDITY AND LIFE CYCLES VARIATION, ADAPTATION AND EVOLUTION ORGANISMS AND THEIR ENVIRONMENTS HEALTH AND DISEASE **PHYSICS** MATTER FORCES AND MOTION SOUND, LIGHT AND WAVES ELECTRICITY AND MAGNETISM EARTH IN SPACE **CHEMISTRY** SUBSTANCES AND PROPERTIES	**Key concepts:** **BIOLOGY** THE CELLULAR BASIS OF LIFE HEREDITY AND LIFE CYCLES VARIATION, ADAPTATION AND EVOLUTION ORGANISMS AND THEIR ENVIRONMENTS HEALTH AND DISEASE **PHYSICS** MATTER FORCES AND MOTION SOUND, LIGHT AND WAVES ELECTRICITY AND MAGNETISM EARTH IN SPACE **CHEMISTRY** SUBSTANCES AND PROPERTIES	**Key concepts:** **BIOLOGY** THE CELLULAR BASIS OF LIFE HEREDITY AND LIFE CYCLES VARIATION, ADAPTATION AND EVOLUTION ORGANISMS AND THEIR ENVIRONMENTS HEALTH AND DISEASE **PHYSICS** MATTER FORCES AND MOTION SOUND, LIGHT AND WAVES ELECTRICITY AND MAGNETISM EARTH IN SPACE **CHEMISTRY** SUBSTANCES AND PROPERTIES	**Key concepts:** **BIOLOGY** THE CELLULAR BASIS OF LIFE HEREDITY AND LIFE CYCLES VARIATION, ADAPTATION AND EVOLUTION ORGANISMS AND THEIR ENVIRONMENTS HEALTH AND DISEASE **PHYSICS** MATTER FORCES AND MOTION SOUND, LIGHT AND WAVES ELECTRICITY AND MAGNETISM EARTH IN SPACE **CHEMISTRY** SUBSTANCES AND PROPERTIES	**Key concepts:** **BIOLOGY** THE CELLULAR BASIS OF LIFE HEREDITY AND LIFE CYCLES VARIATION, ADAPTATION AND EVOLUTION ORGANISMS AND THEIR ENVIRONMENTS HEALTH AND DISEASE **PHYSICS** MATTER FORCES AND MOTION SOUND, LIGHT AND WAVES ELECTRICITY AND MAGNETISM EARTH IN SPACE **CHEMISTRY** SUBSTANCES AND PROPERTIES

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	PARTICLES AND STRUCTURE CHEMICAL REACTIONS EARTH'S ATMOSPHERE DYNAMIC EARTh	PARTICLES AND STRUCTURE CHEMICAL REACTIONS EARTH'S ATMOSPHERE DYNAMIC EARTH	PARTICLES AND STRUCTURE CHEMICAL REACTIONS EARTH'S ATMOSPHERE DYNAMIC EARTH	PARTICLES AND STRUCTURE CHEMICAL REACTIONS EARTH'S ATMOSPHERE DYNAMIC EARTH	PARTICLES AND STRUCTURE CHEMICAL REACTIONS EARTH'S ATMOSPHERE DYNAMIC EARTH	PARTICLES AND STRUCTURE CHEMICAL REACTIONS EARTH'S ATMOSPHERE DYNAMIC EARTH
Conceptual Vocabulary (Component Knowledge)	**Animals including humans** Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak **Plants** Deciduous, Evergreen trees, Leaves, Flowers (blossom),	**Animals including humans** Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, Exercise, Hygiene **Plants** Seeds, Bulbs, Water, Light, Temperature, Growth **Living things and their habitats** Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert	**Animals including humans** Movement, Muscles, Bones, Skull, Nutrition, Skeletons **Plants** Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower **Rocks** Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent	**Animals including humans** Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar **Living things and their habitats** Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats	**Animals including humans** Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty **Living things and their habitats** Mammal, Reproduction, Insect, Amphibian, Bird, Offspring **Properties and changes of materials** Hardness, Solubility, Transparency, Conductivity, Magnetic,	**Animals including humans** Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration **Living things and their habitats** Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects **Evolution and Inheritance**

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	Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem **Everyday Materials** Wood, Plastic, Glass, Paper, Water, Metal, Rock, Hard, Soft, Bendy, Rough, Smooth **Seasonal Changes** Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark **Detailed vocabulary list on individual plans.**	**Everyday materials and their uses** Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil **Detailed vocabulary list on individual plans.**	**Light** Light, Shadows, Mirror, Reflective, Dark, Reflection **Forces and magnets** Magnetic, Force, Contact, Attract, Repel, Friction, Poles, Push, Pull **Detailed vocabulary list on individual plans.**	**States of Matter** Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating **Sound** Volume, Vibration, Wave, Pitch, Tone, Speaker **Electricity** Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators **Detailed vocabulary list on individual plans.**	Filter, Evaporation, Dissolving, Mixing **Earth and Space** Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation **Forces** Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys **Detailed vocabulary list on individual plans.**	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics **Light** Refraction, Reflection, Light, Spectrum, Rainbow, Colour **Electricity** Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell **Detailed vocabulary list on individual plans.**

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Milestones	**Biology:** • Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen. • Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers. • Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. • Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates. • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. • Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets). • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • Notice that animals, including humans, have offspring which grow into adults. • Investigate and describe the basic needs of animals, including humans, for survival (water, food and air). • Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene. • Explore and compare the differences between things that are living, that are dead and that have never been alive. • 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. • Identify and name a variety of plants and animals in their habitats, including micro-habitats. • 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. • Identify how humans resemble their parents in many features. **Chemistry:**	**Biology:** • Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers. • 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. • Investigate the way in which water is transported within plants. • Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. • Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. • Construct and interpret a variety of food chains, identifying producers, predators and prey. • Identify that humans and some animals have skeletons and muscles for support, protection and movement. • Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different types of teeth in humans and their simple functions. • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change and that this can sometimes pose dangers to living things. Identify how plants and animals, including humans, resemble their parents in many features. • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Identify how animals and plants are suited to and adapt to their environment in different ways. **Chemistry:** Rocks and Soils • Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter.	**Biology:** • Relate knowledge of plants to studies of evolution and inheritance. • Relate knowledge of plants to studies of all living things. • Describe the changes as humans develop to old age. • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • 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. • 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. • Describe how living things are classified into broad groups according to common, observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. • Give reasons for classifying plants and animals based on specific characteristics. • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Chemistry:** • Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets. • Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

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	• Distinguish between an object and the material from which it is made. • 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. • Compare and group together a variety of everyday materials on the basis of their simple physical properties. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard for particular uses. **Physics:** • Notice and describe how things move, using simple comparisons such as faster and slower. • Compare how different things move. • Observe and name a variety of sources of light, including electric lights, flames and the Sun, explaining that we see things because light travels from them to our eyes. • Observe and name a variety of sources of sound, noticing that we hear with our ears. • Identify common appliances that run on electricity. • Construct a simple series electrical circuit. • Observe the apparent movement of the Sun during the day. • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.	States of Matter • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Physics:** • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • 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. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. • Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the Sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the size of shadows change. • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • 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. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.	• Demonstrate that dissolving, mixing and changes of state are reversible changes. • 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, oxidation and the action of acid on bicarbonate of soda. **Physics:** Magnets • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. Forces • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effect of drag forces, such as air resistance, water resistance and friction, that act between moving surfaces. • Describe, in terms of drag forces, why moving objects that are not driven tend to slow down. • Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs. • Understand that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. • Understand that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes. • 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. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.

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		• Recognise some common conductors and insulators, and associate metals with being good conductors. • Describe the movement of the Earth relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth.	• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • 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. • Use recognised symbols when representing a simple circuit in a diagram. • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximately spherical bodies. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

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	To work scientifically: • Ask simple questions. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions.		**To work scientifically:** • Ask relevant questions. • Set up simple, practical enquiries and comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. • Identify differences, similarities or changes related to simple, scientific ideas and processes. • Use straightforward, scientific evidence to answer questions or to support their findings.		**To work scientifically:** • Plan enquiries, including recognising and controlling variables where necessary. • Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. • Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions. • Present findings in written form, displays and other presentations. • Use test results to make predictions to set up further comparative and fair tests. • Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments.	
POP tasks	**WALT investigate living things** Create an environment for woodlice in the forest school area – **Prove that this is a successful habitat** **WALT investigate materials** Investigate materials suitable for a baby owl nest. **WALT investigate sound and hearing** Suggest – How can we protect our ears from loud sounds? (Milestone 1 – see page 124 for example) **WALT understand plants** Create a spotters guide to school plants using a categorisation key.	**WALT investigate plant growth** Grow a selection of plants, looking into what each plant needs to grow. Document growth and changes. Seasonal changes can be linked. **WALT investigate materials** Paper is unsuitable for a model boat. Do you agree or disagree? (reason and justify) Devise other hypothesis like this and test them. **WALT investigate what is needed for a healthy lifestyle** Create a picture book for younger children to demonstrate what they know about keeping healthy.	**WALT investigate movement, forces and magnets** Investigate practical applications of the understanding of which materials are not attracted to magnets. Suggest some uses for this in school. **WALT understand animals and humans** How are predators affected by changes in the natural environment? (Milestone 2 – see page 176 for example) **WALT investigate fossils.** Create a fact file about how fossils are formed, where fossils may be found and how they can be safely collected.	**WALT investigate electrical circuits** Children will make an electric quiz board. By the end of this lesson children will be able to make a quiz board using multiple series circuits. **WALT investigate sound and hearing** Suggest a way to prove the relationship between vibration and pitch. True or false? Higher notes are louder than lower notes. **WALT investigate states of matter** Suggest practical uses between the relationship between temperature and evaporation. Suggest. (Milestone 2 –	**WALT understand movement, forces and magnets** Investigate practical applications of the understanding of which materials are not attracted to magnets. Suggest some uses for this in school. **WALT understand Moon phases** In this lesson the children use their Moon diaries as a source of information to investigate how the Moon appears to change shape over a month. By the end of the lesson the children are able to explain that the Moon looks as if it changes shape because, although half of it is always illuminated	**WALT understand animals and humans** Why might (suggest) children in countries affected by war become ill? Investigate malnutrition. (Milestone 2 – see page 175 for example). **WALT create shadow puppets** Children plan, test and make puppets for a shadow theatre. Extension lesson 2 that follows has the performance and evaluation of the activity. Ideally arrange for a class of younger children to be the audience for the performance. **WALT create a guidebook**

Science Curriculum Progression

		WALT investigate living things Always, sometimes, never? Food chains end with a carnivore (Milestone 1 – see page 117 for example)	**WALT investigate important changes in our environment** Research why bees are important and what we need to do to save them. Children need to present their finding but can do so in their chosen media. Eg. news report, poster or PPT. **WALT understand light and seeing** Explain why an umbrella is a useful practical example of shadows. (apply) Give examples of other practical uses for shadows. (apply)	see page 189 for example) **WALT understand invertebrates.** Children make a classification key to sort invertebrates into groups. **WALT investigate toothpaste** Children will try out different recipes for home-made toothpaste. By the end of the lesson they will know why toothpastes contain a range of different ingredients and they will have made and tested some of their own.	by the Sun, we can't always see the entire illuminated half from the Earth. **WALT investigate materials** Generalise: how can the hardness of a rock be related to its origins? **WALT investigate glue** Children learn about the chemist Spencer Silver and how he created Post-it™ notes almost by accident, as he worked to create a super-sticky glue. By the end of this lesson children will have investigated and made glues themselves, identifying the properties of glue and how they can be used for different purposes. **WALT investigate living things** Compare changes in two or more habitats and categorise the effects of the changes Explain the concept of conservation and how groups are trying to preserve habitats.(Milestone 2 – see page 182 example)	Children apply their knowledge from the module to a real life context by looking at living things that they have in their home and their school environment. **WALT understand electrical circuits** Investigate battery powered road cars and draw some conclusions about their benefits and problems. **WALT understand evolution and inheritance** Explain the concept of inheritance. Investigate how scientists and doctors are researching conditions that are inherited from a parent. (Milestone 2 – see page 183 for example)