Science Curriculum Overview

Year	Science Unit	Prior Knowledge/ Learning	Scientific Knowledge Key Questions	Vocabulary As units progress, use and build on the vocabulary from previous relevant units.	Working Scientifically	Enrichment and Engagement activities
1	**Everyday Materials** **(Chemistry)**		1. How can we sort objects into groups based on their material? 2. How can we describe the properties of everyday materials? 3. How can we compare and group materials based on their properties? 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	**material** **wood** **plastic** **glass** **metal** **water** **rock** **paper** **hard/soft** **stretchy/stiff** **shiny/dull** **bendy/rigid** **waterproof/not waterproof** **absorbent/not absorbent** **opaque/transparent**	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions	

1	**Animals Including Humans** **(Biology)**		1. What are the main parts of my body and how do they help me to use my senses? 2. What animals will I see around my school and what other animals do I know? 3. Do all animals eat the same foods? 4. Why do different animals have different shaped bodies? Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, 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	**animals** **fish** **amphibians** **birds** **reptiles** **mammals** **carnivores** **herbivores** **omnivores** **sight** **touch** **hearing** **smell** **taste** **head** **neck** **arms** **elbows** **legs** **knees** **face** **ears** **eyes** **hair** **mouth** **teeth**		Educational Visit to Bristol Museum (Animal and Dinosaur exhibits and workshop) Educational Visit to Bristol Aquarium
1	**Plants** **(Biology)**		1. What trees and plants are in/around our school environment?	**plants** **flowers** **trees**		

			2. What similarities and differences can you see from the leaves found in our school environment? 3. What are the key features of a plant and how can we use these features to identify plants in our local environment? 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	**leaves** **plants** **petals** **roots** **bulb** **seed** **trunk** **branches** **stem** **fruit** **deciduous** **evergreen**		
1	**Seasonal Changes**		1. What are weather patterns and how do these change with the seasons? 2. What is a season and how can we compare them? Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	**weather** **spring** **summer** **autumn** **winter** **year** **day** **night** **moon**		
2	**Living Things and Their Habitats**	Plants (Year 1) Animals Including	1. How can we describe whether something is living or non-living?	**habitat** **micro-habitat** **environment**	• asking simple questions and recognising that	Educational Visit to Bristol Zoo Gardens –

	(Biology)	Humans (Year 1)	2. How are living things suited to the habitats in which we find them? (investigation) 3. What habitats can we find in our local environment? 4. How do animals find their food and what does this look like in different habitats? Explore and compare the differences between things that are living, dead, and things 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 microhabitats 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	**seashore** **ocean** **woodland** **rainforest** **living** **dead** **food chain** **predator** **prey**	they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions	Habitats Workshop
2	**Uses of Everyday Materials**	Everyday Materials (Year 1)	1. How are different materials suited to different uses? (waterproof investigation)	**properties** **suitability** **squashing**		

	(Chemistry)		2. How can we change the shape of a material? Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, 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	**bending** **twisting** **stretching**		
2	**Animals Including Humans** **(Biology)**	Animals Including Humans (Year 1)	1. What is offspring and do all offspring look like their parents? 2. What do all animals and humans need to survive? 3. What is a healthy meal and why is it important? 4. Why is exercise important for humans? Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right	**survival** **water** **air** **food** **adult** **baby** **offspring** **exercise** **hygiene**		

			amounts of different types of food, and hygiene			
2	**Plants** **(Biology)**	Plants (Year 1)	1. How do bulbs and seeds change as they grow? 2. What do plants need to grow healthily? 3. What conditions best support plant growth? (investigation) 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	**water** **light** **temperature** **germination** **growth** **healthy** **survival**		
3	**Light** **(Physics)**	Everyday Materials (Year 1)	1. What is light and why do we need it? 2. Which materials reflect the light the best? 3. How can we protect ourselves from the sun? 4. How are shadows formed and why do they change shape and size? Recognise that they need light in order to see things and that dark is the absence of light	**light** **dark** **reflection/reflective** **source** **shadow** **opaque**		

			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 an opaque object Find patterns in the way that the size of shadows change			
3	**Animals Including Humans** **(Biology)**	Animals Including Humans (Year 1 & 2)	1. What are the different food groups and why are they important for my body? 2. How can we use our understanding of food groups to decide what to eat in a day? 3. What bones are in my body and what job does the skeleton do? 4. How do the bones and muscles in our body help us to move? Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat	**nutrition** **diet** **skeletons** **muscles** **support** **protection** **movement**	• asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using	

			Identify that humans and some other animals have skeletons and muscles for support, protection and movement		a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	
3	**Rocks** **(Chemistry)**	Mary Anning (Year 1) Everyday Materials (Year 1) Mountains, Volcanoes and Earthquakes (Year 3 geography)	1. How can we sort and compare rocks based on their different properties? 2. Which rocks are best for different purposes? 3. What is a fossil and how do they form? 4. What is soil and how can we describe its properties? Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter	**soil** **fossil** **paleontology** **matter** **organic** **sedimentary rock** **sandstone** **granite** **marble** **pumice** **crystals** **absorbent**		Expert Visitor – Volcanologist
3	**Plants** **(Biology)**	Plants (Year 1) Plants (Year 2)	1. What are the different parts of a flower and why are they important? 2. Do all plants need the same things to be healthy?	**structure** **function** **nutrition/nutrients** **soil** **air** **light**		

			3. How is water transported within a plant? 4. How do flowers support the lifecycle of a flowering plant? Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, 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 part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	**water** **support** **reproduction** **pollination** **seed formation** **seed dispersal** **transportation**	• identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	
3	**Forces and Magnets** **(Physics)**	Everyday Materials (Year 1)	1. What is a force and how can it make objects move? 2. How can different surfaces slow down the speed of objects? 3. What is a magnet and how does it behave?	**magnet/magnetic** **force** **push** **pull** **attract** **repel** **poles**		

			4. How can we identify magnetic materials? 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			
4	**Living Things and Their Habitats**	Living Things and Their Habitats (Year 2)	1. What is a classification key and how are they used?	**vertebrate** **invertebrate** **flowering** **non-flowering**	• asking relevant questions and using different types of	

	(Biology)	-*The Journey Home* Fran Preston-Gannon	2. How can a classification key help me to identify leaves in my local area? 3. How can we identify and classify living things in our wider environment? 4. Why do environments change and how does this affect living things? 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	**ecology**	scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	
4	**Animals Including Humans** **(Biology)**	Food chains – Living Things and Their Habitats (Year 2)	1. What teeth do we have and why do we need them? 2. How do we look after our teeth? What is tooth decay and why does it happen? 3. What happens to the food I eat? (We The Curious) 4. What can an animal's teeth tell us about what they eat? 5. What factors influence food chains?	**digestive system** **mouth** **tongue** **teeth** **oesophagus** **stomach** **small intestine** **large intestine** **carnivore** **herbivore** **incisor** **canine** **pre-molar**		Educational Visit to We The Curious – Digestive System Workshop

			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	**molar** **food chain** **producer** **predator** **prey**	• reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	
4	**States of Matter** **(Chemistry)**	Everyday Materials (Year 1) Uses of Everyday Materials (Year 2) Water, weather and climate (Year 3 geography)	1. What are solids, liquids and gases and how are they different? 2. What makes a material change its state? 3. How does temperature affect the state of substances and how can we measure it? 4. What is evaporation and how does temperate affect the rate of evaporation? 5. What are the key processes in a water cycle? 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	**state** **matter** **solid/s** **liquid/** **gas/es** **water cycle** **evaporation** **condensation** **chemical change** **particles** **temperature** **freezing** **heating**		

			the temperature at which this happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature			
4	**Sound** **(Physics)**		1. What is sound and how are sounds made? 2. How do sounds travel? 3. What is pitch and how do objects produce it? 4. What is the best material to insulate sound? Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear 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	**sound** **vibration** **pitch** **volume** **source** **insulation**		

			Recognise that sounds get fainter as the distance from the sound source increases			

4	**Electricity** **(Physics)**		1. What is electricity and what appliances need electricity to work? 2. What is an electrical circuit and what does it need to work? 3. How can I complete a circuit using different components? 4. What materials conduct and insulate electricity? 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 Recognise some common conductors and insulators, and associate metals with being good conductors	**circuit** **cells** **wires** **bulb** **switch** **buzzer** **conductor** **insulator**		

5	**Properties and Changes of Materials** **(Chemistry)**	Everyday Materials (Year 1) Uses of Everyday Materials (Year 2) Forces and Magnets (Year 3)	1. How can we compare and group everyday materials based on their properties? 2. How do substances dissolve in liquids? 3. How can we separate solutions? 4. Why are some materials better suited for certain purposes? 5. Why are some changes irreversible? 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 Know that 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	**substance** **solution** **hardness** **solubility** **transparency** **conductivity** **solid** **liquid** **gas** **filtration** **evaporation** **reversible/irreversible changes**	• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests	

			materials, including metals, wood and plastic 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 and the action of acid on bicarbonate of soda		• reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments.	
5	**Earth and Space** **(Physics)**	Seasonal Changes (Year 1)	1. How can we describe the movement of spherical bodies in our solar system? 2. Why does day and night occur? 3. Why does the Moon appear to change shape over time? 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	**solar system** **rotation** **axis** **orbit** **spherical body** **celestial body** **phases of the Moon** **constellation** **Mercury** **Venus** **Earth** **Mars** **Jupiter** **Saturn** **Uranus** **Neptune** **Pluto (dwarf planet)**		Expert Visitor: The Space Dome (Planetarium)

			apparent movement of the sun across the sky			
5	**Forces** **(Physics)**	Forces and Magnets (Year 3)	1. Why do objects fall to Earth and what affects the rate of fall? 2. What is friction and how does it affect the movement of objects? 3. How do gears, levers and pulleys affect 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 effects of air resistance, water resistance and friction that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	**gravity** **air resistance** **water resistance** **friction** **mechanisms** **levers** **pulleys** **gears**		
5	**Living Things and Their Habitats** **(Biology)**	Animals Including Humans (Year 1)	1. What differences can we identify in the lifecycles of animals? 2. How do plants reproduce?	**life-cycle** **reproduction** **Insect** **mammal** **amphibian** **bird** **Offspring**		

			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	**Asexual** **Sexual**		
5	**Animals Including Humans** **(Biology)**	Animals Including Humans (Years 1 – 4)	1. How do humans change and develop with age? Describe the changes as humans develop to old age	**foetus** **embryo** **womb** **gestation** **baby** **toddler** **teenager** **elderly** **growth** **development** **puberty**		Jigsaw - PSHE This needs to be taught alongside this.
6	**Electricity** **(Physics)**	Electricity (Year 4)	1. How can I correctly draw and represent a circuit using scientific symbols? 2. How does voltage affect the way components function in a circuit? Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	**cells** **wires** **bulbs** **switches** **buzzers** **battery** **circuit** **series** **conductors** **insulators** **amps** **volts**	• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking	

			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		repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has	
6	**Light** **(Physics)**	Light (Year 3)	1. How can we describe the way light travels? 2. How does light make us see objects? 3. Why do shadows have the same shape as the objects that form them? Recognise 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 eye 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	**light** **refraction** **reflection** **spectrum** **rainbow** **colour**		

			Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them		been used to support or refute ideas or arguments.	
6	**Evolution and Inheritance** **(Biology)**	Rocks (Year 3) Mary Anning (History Year 1)	1. What is offspring and how do they vary to their parents? 2. How are living things adapted to their environment and how does it lead to evolution? 3. How can we use fossils to understand the past? 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	**fossils** **paleontology** **offspring** **adaption** **variation** **evolution** **environment** **characteristics** **reproduction** **genetics**		
6	**Living Things and Their Habitats**	Animals Including Humans (Year 1)	1. What are the common characteristics of different organisms and animals?	**classification** **vertebrates** **invertebrates**		

	(Biology)		2. How can we classify plants and animals based on their specific characteristics? Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics	**micro-organisms** **amphibians** **reptiles** **mammals** **insects**		
6	**Animals Including Humans** **(Biology)**	Animals Including Humans (Years 1 – 5)	1. Why do humans need a circulatory system and how does it work? 2. How do your lifestyle choices affect the way your body functions? x 2 lessons 3. How are nutrients and water transported around our bodies? 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	*skeletal system* *muscular system* *digestive system* **circulatory system** **heart** **blood vessels** **veins** **arteries** **oxygenated,** **deoxygenated** **valve** **exercise** **respiration** **nutrients**		

			Describe the ways in which nutrients and water are transported within animals, including humans			