Materials (Chemistry)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR **(States of matter)**	YEAR FIVE	YEAR 6
Science Knowledge	I explore a range of materials, including natural materials. I make objects from different materials, including natural materials. I observe, measure and record how materials change when heated and cooled. I compare how materials change over time and in different conditions. I explore the natural world around me. I describe what I see, hear and feel whilst outside.	I distinguish between an object and the material from which it is made. I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. I can describe the simple physical properties of a variety of everyday materials. I compare and group together a variety of everyday	I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		I compare and group materials together, according to whether they are solids, liquids or gases. I observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). I identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	I can 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. I know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. I can demonstrate that dissolving, mixing and changes of state are reversible changes. I can explain that some changes result in the formation of new materials, and that this kind of	

		materials on the basis of their simple physical properties.				change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	
Substantive knowledge	Children distinguish between objects and the materials from which they are made. They identify and name everyday materials, including wood, plastic, glass, metal, water, and rock. Simple physical properties of materials are discussed, and comparisons are made. Children explore which materials are reflective or show up in the dark. They learn about floating and sinking, as well as melting and freezing (state changes between solids and	All objects are made of one or more materials. Some objects can be made from different materials e.g., plastic, metal, or wooden spoons. Materials can be described by their properties e.g., shiny, stretchy, rough etc. Some materials e.g., plastic can be in different forms with very different properties. All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different		Solids have a fixed shape and volume, liquids take the shape of their container, and gases fill the entire space available. Examples of solids include wood, metal, and plastic. Water is a common liquid, and air is a gas. Material State Changes (Heating and Cooling): Children observe that some materials change state when heated or cooled. For example, water can change from a solid (ice) to a liquid (water) when heated, and vice versa. They measure or research the temperature at which these changes occur (e.g., the melting point of ice or the boiling point of water) in degrees Celsius (°C). Evaporation and Condensation in the Water Cycle: Children learn about the water cycle, which involves processes like evaporation and condensation.		Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation. Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials, and these are not reversible.	

	liquids)	purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g., thickness.	Evaporation occurs when water turns into vapor (gas) due to heating from the sun. Condensation happens when water vapor cools down and forms clouds or dew. The rate of evaporation is influenced by temperature: higher temperatures lead to faster evaporation. Remember, these concepts provide a foundation for understanding the physical properties of materials and natural processes.	
Disciplinary knowledge	Understanding that materials have names and properties helps describe them. Children create objects using different materials, including natural ones. They experiment with shaping materials by squashing, bending, twisting, and squeezing. Children observe how	Classify objects made of one material in different ways e.g., a group of objects made of metal. Classify in different ways one type of object made from a range of materials e.g., a collection of spoons made of different materials. Classify materials based on their properties. Test the properties of objects e.g., absorbency of cloths, strength of planes made of different papers, stiffness of plane wings, waterproofness of clothing. Classify materials.	Comparing and Grouping Materials: Children learn to classify materials based on their states: solids, liquids, or gases. Solids have a fixed shape and volume (e.g., wood, metal). Liquids take the shape of their container (e.g., water). Gases fill the entire space available (e.g., air). Material State Changes (Heating and Cooling): Children observe that some materials change state when heated or cooled. For example, melting occurs when a solid turns into a liquid due to heating.	Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g., test waterproofness and thermal insulation to identify a suitable fabric for a coat. Explore adding a range of solids to water and other liquids e.g., cooking oil, as appropriate. Investigate rates of dissolving by carrying out comparative and fair test. Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture. Explore a range of non-reversible changes e.g., rusting, adding fizzy tablets to water, burning.

	materials change when heated or cooled. For instance, they explore melting (solid to liquid) and freezing (liquid to solid) processes. They can measure or research the temperature at which these changes occur (in degrees Celsius, °C). Children compare how materials change over time and in different conditions.	Make suggestions about alternative materials for a purpose that are both suitable and unsuitable. Test the properties of materials for particular uses e.g., compare the stretchiness of fabrics to select the most appropriate for pilot's uniform, test materials for waterproofness to select the most appropriate for a pilot's uniform.	Freezing is the reverse process (liquid to solid) when cooling. They can measure or research the temperature at which these changes occur (in degrees Celsius, °C). Evaporation and Condensation in the Water Cycle: Evaporation: It's when water changes from a liquid to vapor (gas) due to heating (e.g., by the sun). Warmer temperatures increase the rate of evaporation. Condensation: The opposite process—water vapor cools and becomes liquid (e.g., forming clouds or dew). Dew point (critical temperature) affects condensation. Overall, these processes play a vital role in the water cycle and weather patterns	Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced? Research new materials produced by chemists e.g., Spencer Silver (glue of sticky notes).
Working scientifically	Show curiosity and ask questions. Make observations using their senses and simple equipment. Make direct comparisons. Identify, sort and group.	• Ask their own simple questions about what they notice 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	• 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 dataloggers. • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	• Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • Planning different types of scientific

	Record their observations by drawing, taking photographs, using sorting rings. or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out. Use their observations to help them to answer their 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 • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	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 • 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.
Enquiry types		• observing changes over time. • noticing patterns. • identifying, grouping and classifying.	• observing changes over time. • noticing patterns. • identifying, grouping and classifying.	• observing changes over time. • noticing patterns. • identifying, grouping and classifying. • carrying out comparative and fair tests.

		• carrying out simple comparative tests. • finding things out using secondary sources.		• carrying out comparative and fair tests. • finding things out using secondary sources.		• finding things out using secondary sources.	
Why here/Why now?	Children can use senses to explain what they see, feel, and hear in relation to the world around them. In preparation for year 1.	Sets scene for Year Two materials, e.g., naming some materials and describing their properties.	Build on Year One knowledge. Examine properties of materials and see how they differ when changed.		Water cycle link to water and plant growth in Y3. Introduction of the change of state in preparation for year 5 materials.	Builds on changing state from Y4 and previous classification work.	
Key Vocabulary	ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, , hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back. Expose children to supplementary vocabulary such as: solid, liquid, gas, most suited	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth,	Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/puling, twist/twisting,		Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	

		shiny, dull, see-through, not see-through	squash/squashing, bend/bending, stretch/stretching				

Plants (Biology)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Science knowledge		I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants, including trees.	I can observe and describe how seeds and bulbs grow into mature plants. I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. I can 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. I can investigate the way in which water is transported within plants. I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal			
Substantive knowledge		Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring.		Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance			

		Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.	photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.			
Disciplinary knowledge		Make close observations of leaves, seeds, flowers etc. Compare two leaves, seeds, flowers etc. Classify leaves, seeds, flowers etc. using a range of characteristics. Identify plants by matching them to named images. Make observations of how plants change over a period of time. When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them. Make close observations of seeds and bulbs. Classify seeds and bulbs. Research and plan when and how to plant a range of seeds and bulbs. Look after the plants as they grow – weeding, thinning, watering etc. Make close observations and measurements of their plants growing from seeds and bulbs. Make comparisons between plants as they grow.	Observe what happens to plants over time when the leaves or roots are removed. Observe the effect of putting cut white carnations or celery in coloured water. Investigate what happens to plants when they are put in different conditions e.g., in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space. Spot flowers, seeds, berries and fruits outside throughout the year. Observe flowers carefully to identify the pollen. Observe flowers being visited by pollinators e.g., bees and butterflies in the summer. Observe seeds being blown from the trees e.g., sycamore seeds. Research different types of seed dispersal.			

			Classify seeds in a range of ways, including by how they are dispersed. Create a new species of flowering plant.			
Working scientifically Red = must be done Amber = natural link Black – at the discretion of the investigator.		• Ask their own simple questions about what they notice 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	• 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 dataloggers. • 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 • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.			
Enquiry types		• observing changes over time. • noticing patterns.	• observing changes over time, • noticing patterns,			

		• identifying, grouping and classifying. • carrying out comparative and fair tests. • finding things out using secondary sources.		• grouping and classifying things, • carrying out simple comparative and fair tests • and finding things out using secondary sources			
Why here/Why now?		Build on names / plants work from EYFS. Springtime things start growing	Laying foundation for plant life cycle work in Y3. Knowing what plants need to grow.	Bringing together KS1 work on plants with the plant life cycle and importance of water. Summarises all work on plants. (Food chain-producer)			
Key Vocabulary		Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area	As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)			

Seasonal Changes (Physics)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR SIX
Science knowledge	I play and explore outside in all seasons and in different weather. I observe living things throughout the year. I explore the natural world around me. I describe what I see, hear and feel whilst outside. I understand the effect of changing	I can observe changes across the four seasons. I can observe and describe weather associated with the seasons and how day length varies.					

	seasons on the natural world around me.						
Substantive knowledge	Observing Seasonal Changes: Children can observe changes across the four seasons. Living Things and Seasons: Children explore the natural world by observing living things throughout the year. They notice how animals and plants adapt to different seasons. Outdoor Exploration: Children play and explore outside in all seasons and different weather conditions. They describe what they see, hear, and feel while outdoors, fostering their observational skills and curiosity. By engaging with nature, they develop an appreciation for the beauty and diversity of the natural world.	Seasonal Patterns: Children continue to observe seasonal changes, focusing on patterns in weather, daylight, and temperature. They learn about the four seasons (spring, summer, autumn, and winter) and how they affect the environment and living things. Life Cycles and Seasons: Students explore life cycles of plants and animals, connecting them to seasonal changes. For example, they might study how trees lose leaves in autumn (deciduous trees) or how some animals hibernate during winter. Weather Observations: Children engage in weather observations, recording daily weather conditions (sunny, rainy, windy, etc.). They notice how weather changes across seasons and its impact on their surroundings. Seasonal Celebrations: Students learn about seasonal celebrations (e.g., Christmas, Easter, Diwali) and their cultural significance. They explore how different communities mark specific seasons.					
Disciplinary knowledge	Seasonal Patterns: Children observe and explore the changing seasons, paying attention to weather patterns, daylight hours, and temperature variations. They learn about the four seasons (spring,	Seasonal Patterns: Children continue to observe seasonal changes, focusing on patterns in weather, daylight, and temperature. They learn about the four seasons (spring, summer, autumn, and winter) and how they affect the environment and living things.					

	summer, autumn, and winter) and how they impact the environment and living things. Life Cycles and Seasons: Students connect seasonal changes to life cycles of plants and animals. For example, they might study how trees lose leaves in autumn (deciduous trees) or how some animals hibernate during winter. Weather Observations: Children engage in weather observations, recording daily weather conditions (sunny, rainy, windy, etc.). They notice how weather changes across seasons and its effects on their surroundings. Seasonal Celebrations: Students learn about cultural celebrations associated with specific seasons (e.g., Christmas, Easter, Diwali). They explore how different communities mark particular times of the year. Remember, these concepts are introduced gradually in EYFS, fostering curiosity and understanding of the natural world.	Life Cycles and Seasons: Students explore life cycles of plants and animals, connecting them to seasonal changes. For example, they might study how trees lose leaves in autumn (deciduous trees) or how some animals hibernate during winter. Weather Observations: Children engage in weather observations, recording daily weather conditions (sunny, rainy, windy, etc.). They notice how weather changes across seasons and its impact on their surroundings. Seasonal Celebrations: Students learn about seasonal celebrations (e.g., Christmas, Easter, Diwali) and their cultural significance. They explore how different communities mark specific seasons. Remember, Year 1 builds upon the foundational concepts introduced in EYFS, allowing students to deepen their understanding of seasonal changes.					
Working	Show curiosity and ask questions.	• Ask their own simple questions about what they notice and					

scientifically	Make observations using their senses and simple equipment. Make direct comparisons. Identify, sort and group. Record their observations by drawing, taking photographs, using sorting rings. or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out. Use their observations to help them to answer their questions	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					
Enquiry types		• observing changes over time. • noticing patterns. • identifying, grouping and classifying. • carrying out comparative and fair tests. • finding things out using secondary sources.					
Why this/Why now?	Build on from work that is focussed on plants. What is different in the world now and what can be seen (compared to last season)	To use what they have already learnt from EYFS to explain the world around us in greater detail. Seasonal changes – what's different?					
Key Vocabulary	spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail,	Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length					

	sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers Expose children to supplementary vocabulary such as: hibernate, migrate, snowflake						

Rocks and Soil (Chemistry)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Science knowledge				I compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. I describe in simple terms how fossils are formed when things that have lived are trapped within rock. I recognise that soils are made from rocks and organic matter.			
Substantive knowledge				Rock is a naturally occurring material. There are different types of rock e.g., sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.			
Disciplinary knowledge				Observe rocks closely. Classify rocks in a range of ways, based on their appearance. Devise a test to investigate the hardness of a range of rocks. Devise a test to investigate how much water different rocks absorb.			

				Observe how rocks change over time e.g., gravestones or old building. Research using secondary sources how fossils are formed. Observe soils closely. Classify soils in a range of ways based on their appearance. Devise a test to investigate the water retention of soils. Observe how soil can be separated through sedimentation. Research the work of Mary Anning.			
Working scientifically				• 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 dataloggers. • 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 • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.			
Enquiry types				• observing changes over time, • noticing patterns, • grouping and classifying things, • carrying out simple comparative and fair tests • and finding things out using secondary sources			
Why this/Why now?				Standalone unit – lays groundwork for Y6 evolution / inheritance with work on fossils. Classifying rocks – supports classification work in Y4.			

Key Vocabulary				Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil			

Animals including Humans (Biology)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Science knowledge	**Excluding humans** I name and describe animals that live in different habitats. I describe different habitats. I recognise some environments that are different to the one in which I live. **Including humans** I describe people who are familiar to me. I learn about how to take care of myself. I talk about members of my immediate family and community. I name and describe people who are familiar to me.	Term 1 - I identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. I identify and name a variety of common animals that are carnivores, herbivores and omnivores. I describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds	I notice that animals, including humans, have offspring which grow into adults. I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air) I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Term 1 – I can 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. Term 2 - I identify that humans and some other animals have skeletons and muscles for support, protection, and movement.	I describe the simple functions of the basic parts of the digestive system in humans. I can identify the different types of teeth in humans and their simple functions. I can construct and interpret a variety of food chains, identifying producers, predators and Prey.	I can describe the changes as humans develop to old age.	I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. I can describe the ways in which nutrients and water are transported within animals, including humans.

		and mammals, including pets) Term 2 - I identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.					
Substantive knowledge	All about Me My body and senses What I need to grow Talk about their bodies/characteristics and identify similarities/differences. Identify 5 senses and how we use these to explore the world. Notice about how they have changed from being younger/a baby. Talk about what humans need to grow (healthy eating, sleep, hygiene, exercise) Animals British wildlife animals British garden	Common Animals: Children identify and name common animals that are carnivores, herbivores, and omnivores. They describe and compare the structure of various animals, including fish, amphibians, reptiles, birds, and mammals (including pets).	Offspring and Growth: Students learn that animals, including humans, have offspring. They understand that offspring grow into adults. Basic Needs: Children recognize that animals, including humans, need water, food, and air for survival. They explore the importance of exercise, diet, and	Living things need food to grow and stay healthy. Plants can make their own food through photosynthesis, but animals cannot. Humans require a balanced diet with nutrients like carbohydrates, proteins, fats, vitamins, and minerals. Muscles allow movement by contracting and relaxing.	Humans have different types of teeth (incisors, canines, premolars, molars) for various functions (biting, tearing, grinding). The process of digestion begins in the mouth with chewing and saliva. The role of enzymes in breaking down food in the stomach and small intestine.	Changes in Humans During Their Lifetime: Understanding how humans change as they grow older. Learning about puberty, physical development, and emotional changes. Reproductive System: Introducing the male and female	Students learn to identify and name the main parts of the human circulatory system. They understand the functions of the heart, blood vessels, and blood. The circulatory system plays a crucial role in transporting nutrients, oxygen, and

	birds Name British wildlife (that could be found in school grounds) hedgehog, squirrel, fox, badger, owl, rabbit. Name British garden birds (that could be found in school grounds) blue-tit, robin, blackbird, thrush, sparrow. Identify different body parts associated with different animals (wing, talons, bushy tail)		hygiene for humans. Remember, this foundational knowledge sets the stage for deeper exploration as students progress in their scientific understanding.	Exercise helps keep muscles strong and healthy. The human skeleton provides support, protection, and shape. Bones are connected by joints, allowing movement. Different types of bones (e.g., long, flat, short) serve various functions. Proper hygiene (washing hands, brushing teeth) is essential for health. Understanding the importance of cleanliness and personal care.		reproductive organs. Discussing the process of fertilization and pregnancy. Health and Well-Being: Emphasizing the importance of a healthy lifestyle. Covering topics like nutrition, exercise, and mental well-being.	waste products throughout the body. Impact of Diet, Exercise, Drugs, and Lifestyle: Students recognize how diet, exercise, drugs, and lifestyle choices affect their bodies. They explore the importance of maintaining a healthy lifestyle for overall well-being. Nutrient and Water Transport: Students describe the ways in which nutrients (such as glucose, amino acids, and fatty acids) are transported

							within animals, including humans. Nutrient-rich blood travels from the digestive system to the liver via the hepatic portal vein. The liver processes and distributes nutrients to body cells via the circulatory system. Water is absorbed from the digestive system and carried to body tissues, essential for cell function and overall hydration.
Disciplinary knowledge	Common Animals: Children explore and compare the structure	Common Animals: Children explore and compare the	Offspring and Growth:	Nutrition: Animals, including humans, need the	Habitats and Adaptations:	This unit is likely to be taught through direct instruction due to its sensitive nature, although children	

	of various animals, including fish, amphibians, reptiles, birds, and mammals (including pets). They learn about different body parts and their functions. Basic Needs: Students recognize that animals, including humans, need water, food, and air for survival. They understand the importance of exercise, diet, and hygiene for humans. Remember, these concepts are introduced gradually in EYFS, fostering curiosity and understanding of the natural world.	structure of various animals, including fish, amphibians, reptiles, birds, and mammals (including pets). They learn about different body parts and their functions. Basic Needs: Students recognize that animals, including humans, need water, food, and air for survival. They understand the importance of exercise, diet, and hygiene for humans.	Students learn that animals, including humans, have offspring. They understand that offspring grow into adults. Basic Needs: Children recognize that animals, including humans, need water, food, and air for survival. They explore the importance of exercise, diet, and hygiene for humans.	right types and amount of nutrition. They cannot make their own food; they get nutrition from what they eat. Skeleton and Muscles: Humans and some other animals have skeletons and muscles. Skeletons provide support and protection, while muscles allow movement.	Animals live in different habitats (e.g., forests, deserts, oceans). They adapt to their environment to survive (e.g., camouflage, hibernation). Life Cycles: Students learn about life cycles of animals (e.g., metamorphosis in insects, birth and growth in mammals). Classification: Animals are grouped based on common characteristics (e.g., vertebrates vs. invertebrates, mammals vs. reptiles). Food Chains and Webs: Students explore how animals are connected in ecosystems through	can carry out a research enquiry by asking an expert e.g., nurse to provide answers to questions that have been filtered by the teacher.

					food chains and food webs.	
Working scientifically	Show curiosity and ask questions. Make observations using their senses and simple equipment. Make direct comparisons. Identify, sort and group. Record their observations by drawing, taking photographs, using sorting rings. or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out. Use their observations to help them to answer their questions	• Ask their own simple questions about what they notice 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		• 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 dataloggers. • 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 • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	• Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • 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

						• 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.	
Enquiry types		• observing changes over time, • noticing patterns, • grouping and classifying things, • carrying out simple comparative and fair tests • and finding things out using secondary sources		• observing changes over time, • noticing patterns, • grouping and classifying things, • carrying out simple comparative and fair tests • and finding things out using secondary sources		• observing changes over time. • noticing patterns. • identifying, grouping and classifying. • carrying out comparative and fair tests. finding things out using secondary sources.	
Why this/Why now?	Introduction to the word habitat and understanding that that is where animals and humans live. Discussions of families and communities and living together.	Builds on basic idea / concepts on the human body from EYFS. Sets the scene for developing Y2 basic needs / reproduction / etc.	Developing the idea of exercise / hygiene / healthy living as part of basic needs builds on food / teeth from EYFS / Y1. Sets scene for skeletal system / nutrition / health in Y3	Develop the pupils' knowledge of the skeletal/ muscular system from Y2 and link this with exercise / health / nutrition. Concept of transport system (blood) for Y4 / Y6	Concept of nutrition from Y3 – now "what happens to the food we eat?" Function and role of teeth in nutrition / digestion Food chains further	Builds on reproduction from Y2 and changes in lifestyle from Y3 / Y4	Builds on Y3 circulation work / balanced diet. As pupils are developing looks at negative impacts of lifestyle on human system

					developed from Y2 work.		
Key Vocabulary	names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice Expose children to supplementary vocabulary such as: environment, polar regions, ocean, camouflage	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves. Names of animals experienced first-hand from each vertebrate group Parts of the body including those linked to PSHE teaching. Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (Examples – meat, fish, vegetables, bread, rice, pasta)	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain	Puberty – the vocabulary to describe sexual characteristics	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle

Living Things and their Habitats (Biology)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6

Science knowledge	I explore the plants in the surrounding natural environment. I explore the animals in the surrounding natural environment. I explore plants and animals in a contrasting natural environment. I draw information from a simple map. I explore the natural world around me. I describe what I see, hear and feel whilst outside. I recognise some environments that are		I explore and compare the differences between things that are living, dead, and things that have never been alive. I can 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. I can identify and name a variety of plants and animals in their habitats, including micro habitats. I can 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.		I recognise that living things can be grouped in a variety of ways. I explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. I recognise that environments can change and that this can sometimes pose dangers to living things.	I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. I can describe the life process of reproduction in some plants and animals.	I can 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. I can give reasons for classifying plants and animals based on specific characteristics.

	different to the one in which they live.						
Substantive knowledge	Match the Animals to Their Habitats: Introduce the concept of habitats by discussing where animals live. Listening Skills - Animals and Habitats: Enhance listening skills by identifying sounds related to animals and their habitats.	All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g., leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.) An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels). Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water. Within a habitat there are different micro-habitats e.g., in a woodland – in the leaf litter, on the bark of trees, on	Habitats and Adaptations: Animals live in different habitats (e.g., forests, deserts, oceans). They adapt to their environment to survive (e.g., camouflage, hibernation). Life Cycles: Learn about life cycles of animals (e.g., metamorphosis in insects, birth and growth in mammals). Classification: Animals are grouped based on common characteristics (e.g., vertebrates vs. invertebrates, mammals vs. reptiles). Food Chains and Webs: Explore how animals are connected in ecosystems through food chains and food webs.	As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g., caterpillars to butterflies. This is called a metamorphosis. Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects.

		the leaves. These micro-habitats have different conditions e.g., light or dark, damp or dry. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain.		
Disciplinary knowledge	Nature Exploration: Children love being outside and observing nature. They learn that living things need care to survive. Basic Understanding: Plants and animals need water and food. Weather and seasons impact daily life. Concern for Living Things:	Explore the outside environment regularly to find objects that are living, dead and have never lived. Classify objects found in the local environment. Observe animals and plants carefully, drawing and labelling diagrams. Create simple food chains for a familiar local habitat from first-hand observation and research. Create simple food chains from information given e.g., in picture books	Observation Skills: Students should be able to observe and describe features of plants and animals. They learn to notice details in different habitats. Research Skills: Children can research and gather information about specific habitats. They learn to use books, websites, and other resources. Classification Skills: Students practice grouping living things based on common characteristics. They understand how scientists classify organisms. Recording and Communication: Children record their observations in notes, drawings, or charts.	Use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals. Compare the gestation times for mammals and look for patterns e.g., in relation to size of animal or length of dependency after birth. Look for patterns between the size of an animal and its expected life span. Grow and observe plants that reproduce asexually e.g., strawberries, spider plants, potatoes. Take cuttings from a range of plants e.g., African violet, mint. Plant bulbs and then harvest to see how they multiply. (Potato tubers from farm visit) Use secondary sources to find out about pollination.

	Children show care for plants and animals. They understand the importance of taking care of living things. Observations and Classification: Children observe and group living things. They learn about similarities and differences.		They learn to communicate their findings to others.	
Working scientifically	Show curiosity and ask questions. Make observations using their senses and simple equipment. Make direct comparisons. Identify, sort and group.	• Ask their own simple questions about what they notice 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	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 dataloggers. • 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	• Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • 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

	Record their observations by drawing, taking photographs, using sorting rings. or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out. Use their observations to help them to answer their questions				• 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	• 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 been used to support or refute ideas or arguments.	
Enquiry types		• observing changes over time, • noticing patterns, • grouping and classifying things, • carrying out simple comparative tests, •finding things out using secondary sources			• observing changes over time, • noticing patterns, • grouping and classifying things, • carrying out simple comparative and fair tests • and finding things out using secondary sources	• observing changes over different periods of time, • noticing patterns, • grouping and classifying things, • carrying out comparative and fair tests • and finding things out using a wide range of secondary sources.	
Why this/Why now?	Build an understanding that the world is different in different places.		Why carnivores, herbivores & omnivores live where they do – features of different habitats. Beginning of energy transfer		Builds on grouping / classification from KS1 Introduces concept of adaptation for Y6 and damage to habitats	Uses human life cycle from term 1 to extend to plants / other animals.	Pulling themes / work from last 6 years together to

	Help pupils understand animals live in different places.		concept for Y4 (food chains)			Reproduction / inheritance / adaptation work from Y4/Y5 sets scene for Y6 work	apply scientific method to evolution and inheritance.
Key Vocabulary	plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment e.g., beach, forest Expose children to supplementary vocabulary such as: environment		Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed. Names of local habitats e.g., pond, woodland etc. Names of micro-habitats e.g., under logs, in bushes etc.		Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering

Forces (Physics)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6

Science knowledge	I explore how to change how things work. I explore how the wind can move objects. I explore how objects move in water. I explore the natural world around me. I describe what I see, hear and feel whilst outside			I can compare how things move on different surfaces. I notice that some forces need contact between two objects, but magnetic forces can act at a distance. I observe how magnets attract or repel each other and attract some materials and not others. I 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. I describe magnets as having two poles. I predict whether two magnets will attract or repel each other, depending on which poles are facing.		I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces. I recognise that some mechanisms, including levers, pulleys, and gears, allow a smaller force to have a greater effect.	
Substantive knowledge				A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better, or it may hinder its movement e.g., ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g., stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g., two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g., a north and south, are brought together they will pull together – attract.		A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object. A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance, and the resulting large force moves a small distance, e.g., a crowbar or bottle top remover.	

					Pulleys, levers and gears are all mechanisms, also known as simple machines.
Disciplinary knowledge				Carry out investigations to explore how objects move on different surfaces e.g., spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. Explore what materials are attracted to a magnet. Classify materials according to whether they are magnetic. Explore the way that magnets behave in relation to each other. Use a marked magnet to find the unmarked poles on other types of magnets. Explore how magnets work at a distance e.g., through the table, in water, jumping paper clips up off the table. Devise an investigation to test the strength of magnets.	Investigate the effect of friction in a range of contexts e.g., trainers, bathmats, mats for a helter-skelter. Investigate the effects of water resistance in a range of contexts e.g., dropping shapes through water and pulling shapes, such as boats, along the surface of water. Investigate the effects of air resistance in a range of contexts e.g., parachutes, spinners, sails on boats. Explore how levers, pulleys and gears work. Make a product that involves a lever, pulley or gear. (DT link Lego Wedo resource) Create a timer that uses gravity to move a ball. Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation
Working scientifically	Show curiosity and ask questions. Make observations using their senses and simple equipment. Make direct comparisons. Identify, sort and group. Record their observations by drawing, taking			• 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 dataloggers. • 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	• Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • 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

	photographs, using sorting rings. or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out. Use their observations to help them to answer their questions			• 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.		• 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 been used to support or refute ideas or arguments.	
Enquiry types				• observing changes over time, • noticing patterns, • grouping and classifying things, • carrying out simple comparative and fair tests • and finding things out using secondary sources		• observing changes over different periods of time, • noticing patterns, • grouping and classifying things, • carrying out comparative and fair tests • finding things out using a wide range of secondary sources.	
Why here/Why now?	Children will be introduced to vocabulary and meanings of 'push' and 'pull' in air and water.			By understanding 'everyday' materials from year 2, children will then look at objects that are magnetic: what attracts / repels. How objects can be lifted and lowered.		Builds on prior knowledge from Year Three then moves on to the effects of water and air resistance.	
Key Vocabulary	float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall,			Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal,		Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	

	fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow, bounce. Expose children to supplementary vocabulary such as: force, rotate, solid, liquid, gravity			iron, steel, poles, north pole, south pole			

Light (Physics)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Science knowledge	I explore shadows. I explore rainbows. I describe what I see, hear and feel whilst outside.			I recognise that they need light in order to see things and that dark is the absence of light I notice that light is reflected from surfaces. I recognise that light from the sun can be dangerous and that there are ways to protect their eyes. I recognise that shadows are formed when the light from a light source is blocked by an opaque object. I can find patterns in the way that the size of shadows change.			I recognise that light appears to travel in straight lines. I 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. I can 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. I use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Substantive knowledge	Light Is Energy: Light is a special kind of energy that helps us see things. It comes from sources like the Sun and light bulbs. Sun and Shadows: The Sun gives us light during the day. When something blocks the Sun, it creates a shadow on the ground. Colours and Rainbows: Light has different colours, like a rainbow. We can see these colours when light passes through a			We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface	Light Travels in Straight Lines: Children recognize that light appears to travel in straight lines. They understand that objects are seen because they give out or reflect light into the eye. How We See Things: Students explain that we see objects because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Shadows have the same shape as the objects that cast them due to light traveling in straight lines. Parts of the Eye: Children learn about the different parts of the eye and their functions in enabling vision. Light Spectrum: Students explore the composition of white light and how it can be split into colors using a prism.

	special glass called a prism. Reflecting Light: Mirrors bounce back light, so we can see our reflection in them.				
Disciplinary knowledge	Observation Skills: Encourage children to observe natural phenomena related to light, such as sunlight, shadows, and reflections. Help them notice how light behaves differently when it hits different surfaces. Communication Skills: Children should be able to express what they see and			Explore how different objects are more or less visible in different levels of lighting. Explore how objects with different surfaces, e.g., shiny vs matt, are more or less visible. Explore how shadows vary as the distance between a light source and an object or surface is changed. Explore shadows which are connected to and disconnected from the object e.g., shadows of clouds and children in the playground. Choose suitable materials to make shadow puppets. Create artwork using shadows.	Observation Skills: Students observe how light travels in straight lines. They notice shadows and understand their shape. Scientific Inquiry Skills: Children ask questions about light and explore them through experiments. They learn to form hypotheses and test them. Measurement Skills: Students measure angles of incidence and reflection. They use tools like protractors and rulers. Communication Skills: Children explain their findings about light to others. They use scientific vocabulary to describe phenomena.

	describe their observations. Use simple language to discuss concepts like “bright,” “dark,” “shiny,” and “shadow.” Fine Motor Skills: Activities like using flashlights, creating shadow puppets, or exploring reflective materials help develop fine motor skills. Holding and manipulating objects during experiments contribute to their overall development. Curiosity and Exploration: Foster curiosity by asking				

	questions like, "What happens when we shine a light on this object?" Encourage them to explore light sources, colors, and shadows through play.				
Working scientifically	Show curiosity and ask questions. Make observations using their senses and simple equipment. Make direct comparisons. Identify, sort and group. Record their observations by drawing, taking photographs, using sorting rings.			• 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 dataloggers. • 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 • identifying differences, similarities or changes related to simple scientific ideas and processes	• Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • 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 • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and

	or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out. Use their observations to help them to answer their questions			• using straightforward scientific evidence to answer questions or to support their findings		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.	
Enquiry types				• observing changes over time, • noticing patterns, • grouping and classifying things, • carrying out simple comparative and fair tests • and finding things out using secondary sources.		• observing changes over time, • noticing patterns, • grouping and classifying things, • carrying out simple comparative and fair tests • and finding things out using secondary sources.	
Why this/Why now?	Children will be introduced to the vocabulary of light and dark throughout the year and how the sun creates a shadow.			First time light is met formally – but builds on EYFS / KS1 work on natural world, seasons plants. Lays the concepts for Y5 Night & day and Y6 light units.			Builds on Year Three light. Use knowledge to explain how periscopes, binoculars and mirrors work. Importance of search lights and periscopes used on boats – could be linked to WW2 learning in History.
Key Vocabulary	Sun, sunny, light, shadow, shady, clouds, torch, see-through, non-see			Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous			As for Year 3 - Light, plus straight lines, light rays

	through, source, light source. Expose children to supplementary vocabulary such as: casting a shadow, pale, dark, transparent, opaque						

Sound (Physics)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Science knowledge	I listen to sounds outside and identify the source. I make sounds. I describe what I see, hear and feel whilst outside.				I can identify how sounds are made, associating some of them with something vibrating. I can recognise that vibrations from sounds travel through a medium to the ear. I can find patterns between the pitch of a sound and features of the object that produced it. I can find patterns between the volume of a sound and the strength of the vibrations that produced it. I recognise that sounds get fainter as the distance from the sound source increases.		
Substantive knowledge	Children recognize that vibrations from sounds travel through a medium (such as air) to reach the ear.				Children learn how sounds are produced when objects vibrate.		

	They find patterns between the pitch of a sound and features of the object that produced it. Additionally, they notice that sounds get fainter as the distance from the sound source increases				They associate specific sounds with the vibration of particular objects. Understanding that sound waves travel through a medium (such as air) and make the eardrum vibrate is part of their substantive knowledge.		
Disciplinary knowledge	Children explore the natural world using their five senses. They describe the impact of weather and seasons on their daily life. Naming and describing familiar plants and animals are part of their ecological understanding. They also show concern for living things, being careful not to damage plants				Children explore the scientific process by making observations, asking questions, and forming hypotheses. They learn to use scientific vocabulary and communicate their findings. Investigating sound-related phenomena and conducting simple experiments contribute to their disciplinary		
Working scientifically	Show curiosity and ask questions. Make observations using their senses and simple equipment. Make direct comparisons. Identify, sort and group. Record their observations by drawing, taking photographs, using sorting rings. or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out. Use their observations to help them to answer their questions				• 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 dataloggers. • 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 • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.		
Enquiry types of the investigator					• observing changes over time. • noticing patterns. • identifying, grouping and classifying. • carrying out comparative and fair tests. • finding things out using secondary sources.		
Why this/Why now?	Can take time to listen to and identify where sound comes from whilst outside. Understand that they can make different sounds.				Stand-alone unit sound is only done once. Children can learn key differences between light and sound.		
Key Vocabulary	sound, noise, listen, hear, music, voices, bird song, traffic, sirens, thunder, high, low, loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar. Expose children to supplementary vocabulary such as: source, crescendo, vibration, pitch				Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation		

States of Matter (Chemistry)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Content					**Covered in Materials.**		
Why this/Why now?							

Key Vocabulary							

Earth and Space

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Science knowledge	I learn about the Earth, Sun, Moon, planets and stars. I learn about space travel. I explore the natural world around me. I describe what I see, hear and feel whilst outside.					I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. I can describe the movement of the Moon relative to the Earth. I can describe the Sun, Earth, and Moon as approximately spherical bodies. I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
Substantive knowledge	Children describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts, and maps. They recognize similarities and differences between					The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical.	

	different religious and cultural communities within their country. Additionally, they compare life in their country to life in other countries, drawing insights from stories, non-fiction texts, and maps						
Disciplinary knowledge	Children develop geographical vocabulary and learn about the world through first-hand experiences, stories, and play. They explore their local environment, use maps, and engage in discussions. Encouraging curiosity and asking questions helps them understand the world around them					Use secondary sources to help create a model e.g., role play or using balls to show the movement of the Earth around the Sun and the Moon around the Earth. Use secondary sources to help make a model to show why day and night occur. Make first-hand observations of how shadows caused by the Sun change through the day. Make a sundial. Research time zones. Consider the views of scientists in the past and evidence used to deduce shapes and movements of the Earth, Moon and planets before space travel.	

Working scientifically	Show curiosity and ask questions. Make observations using their senses and simple equipment. Make direct comparisons. Identify, sort and group. Record their observations by drawing, taking photographs, using sorting rings. or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out. Use their observations to help them to answer their questions					• Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • 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 • 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.	
Enquiry types						• observing changes over different periods of time, • noticing patterns, • grouping and classifying things, • carrying out comparative and fair tests • and finding things out using a wide range of secondary sources.	

Why this/Why now?	Introduction that the Earth where we live is a planet and that there are other planets. The sun gives us light, and the moon is a reflection of light from the sun.					Use knowledge of light for day / night from Year 3 and introduce light as a source of the Sun and reflection of light from the Moon.	
Key Vocabulary	Sun, Moon, Earth, star, planet, sky, day, night, space, round, bounce, float Expose children to supplementary vocabulary such as: sunrise, sunset, astronaut, astronomer, constellation, orbit, nocturnal, slow-motion, magnify					Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets	

Electricity (Physics)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Science knowledge					I can identify common appliances that run on electricity. I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.		I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

					I can 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. I recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. I recognise some common conductors and insulators, and associate metals with being good conductors		I can 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. I can use recognised symbols when representing a simple circuit in a diagram.
Substantive knowledge					Children identify common appliances that run on electricity. They construct a simple series electrical circuit, naming its basic parts (cells, wires, bulbs, switches, and buzzers). Recognizing whether a lamp will light in a simple series circuit based on its connection to a battery is part of their substantive knowledge. They also recognize some common conductors (materials that allow electricity to flow easily) and insulators (materials that don't allow easy flow of electricity)		Electrical Components: Students should be familiar with common electrical appliances and understand how to construct a simple series electrical circuit. They should be able to identify and name basic components of a circuit, such as cells, wires, bulbs, switches, and buzzers. Energy Conversion: Electricity can be converted into other types of energy, such as light, heat, movement, or sound. Power is a measure of how fast electrical energy is transformed into another form1. Generators: Students should know that electricity is created by generators powered by various sources like gas, coal, oil, wind, or solar energy.

Disciplinary knowledge					Children explore the scientific process by constructing circuits, making observations, and asking questions. They learn about safety when working with electricity. Investigating conductors, insulators, and the impact of switches on circuits contributes to their disciplinary understanding		Circuit Design: Understand the role of a switch in opening and closing a circuit. Learn to recognise and draw different circuit symbols when designing your own electric circuit2. Conceptual Understanding: Teachers should address possible misconceptions and facilitate correct understanding of electricity concepts. This includes knowing how electrical components work together and the principles behind energy conversion3. Scientific Investigation: Encourage students to set up tests and inquiries related to electricity, fostering a deeper understanding of the subject
Working scientifically					• 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 dataloggers. • 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		• Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • planning different types of scientific enquiries to answer

					• identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.		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 • 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.
Enquiry types					• observing changes over time. • noticing patterns. • identifying, grouping and classifying. • carrying out comparative and fair tests.		• observing changes over time. • noticing patterns. • identifying, grouping and classifying.

					• finding things out using secondary sources.		• carrying out comparative and fair tests. • finding things out using secondary sources.
Why this/Why now?					Use knowledge of forces to create simple circuits. Know key elements of a circuit.		Reinforce learning from year Four. Use knowledge to accurately draw circuits. Look at voltage / cells and come up with reasons why components won't work.
Key Vocabulary					Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol. N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6		Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage N.B. Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used. interchangeably.

Evolution and Inheritance (Biology)

Concept	EYFS	YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR	YEAR FIVE	YEAR 6
Science knowledge							I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Substantive knowledge							Evolution: Understand how living things change over time. Learn about adaptations, natural selection, and how species evolve. Inheritance: Explore how traits are passed from parents to offspring. Discover genetic information and family resemblances. Life Processes: Study how living organisms grow, reproduce, and survive. Investigate life cycles and development.
Disciplinary knowledge							Scientific Inquiry: Ask questions, make observations, and conduct experiments. Understand how scientists gather evidence. Evidence and Reasoning: Use data and evidence to support ideas. Learn to think critically and evaluate scientific claims. Revision and Improvement: Science knowledge evolves. Scientists revise theories based on new evidence. Understand that science is always improving!
Working scientifically							• Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • 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 • 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.
Enquiry types							• observing changes over time. • noticing patterns. • identifying, grouping and classifying.

							• carrying out comparative and fair tests. • finding things out using secondary sources.
Why this/Why now?							Pulling themes / work from last 6 years together to apply scientific method to evolution and inheritance.
Key Vocabulary							Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils

Chemistry subjects – materials, rocks and soils, states of matter

Physics – seasonal changes, forces and magnets, light, sound, electricity, earth and space

Biology – animals including humans, plants, living things and their habitats, evolution and inheritance.