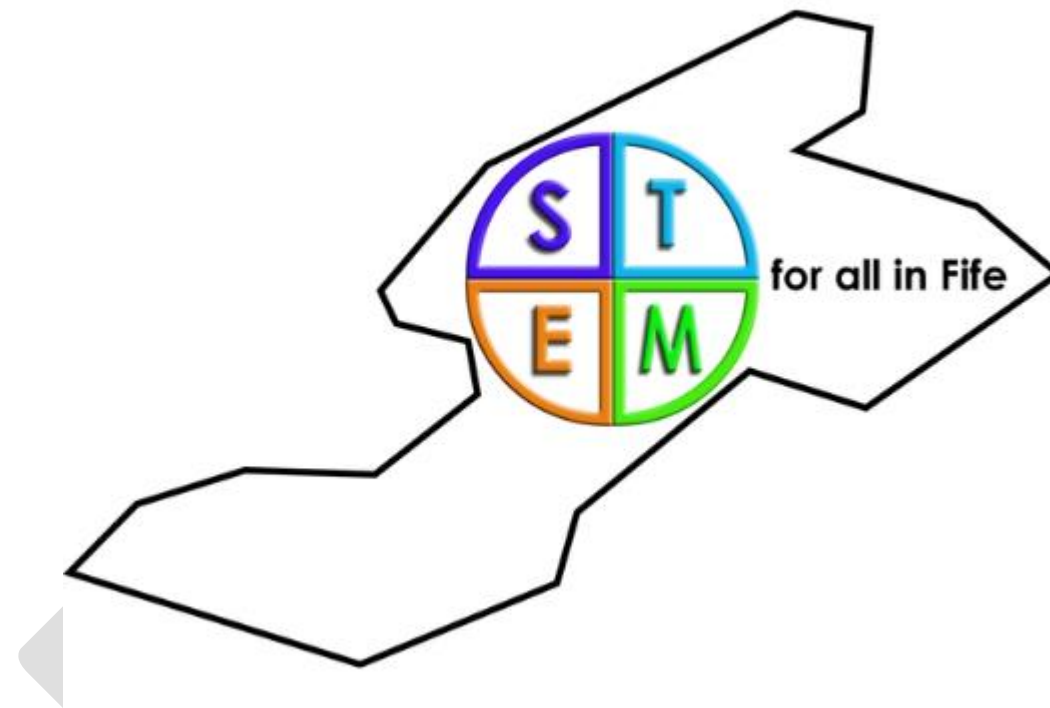


Fife Sciences Overviews



Early, First and Second Level

GUIDANCE

The Overview provides a clear and structured framework to support practitioners in identifying key indicators of progress throughout each phase of development.

Designed to complement the Fife Progression Pathways, these materials support flexible and responsive planning, while aiding the monitoring and tracking of progress across organisers and skills.

Each CfE Level has been divided into phases to show progression within the Level.

Early		First			Second			Third			Fourth		
Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	Phase 9	Phase 10	Phase 11	Phase 12	Phase 13
											Used in some curricular areas only		

Benchmark statements are emboldened and embedded within each line of progression. Typically Benchmarks appear at Phase 1 (Early), 4 (First), 7 (Second), 10 (Third) and 13 (Fourth) to illustrate achievement of a Level.

Effective use of this documentation is supported by:

- Engagement in professional learning around Learning, Teaching and Assessment
- A collaborative, whole school/faculty agreement on consistent use for planning and assessment of knowledge, application and skills
- School-specific systems for evaluating learning and informing professional judgement

In science, the scientific skills have been summarised to support holistic assessment approaches allowing practitioners to confidently track and evaluate learners’ attainment.

		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Scientific Skills	Inquiry and investigative skills	<u>Exploring through play:</u> Shows curiosity and engagement by exploring objects and environments and asks simple questions. Understands basic safety and follows guidance when using senses and simple tools. Communicates simple ideas by describing what they see or do and sorting objects by basic features. Recognises simple patterns and relationships in everyday experiences and begins to connect findings to questions.	<u>Exploring through play:</u> Asks simple questions and makes basic predictions based on observations. Follows safety rules and uses simple tools to make and record observations with guidance. Sorts and represents information in basic formats (lists, simple charts) and shares ideas. Recognises obvious patterns and begins linking findings to everyday experiences.	<u>Through play and exploration:</u> Asks questions, makes simple predictions, and suggests ways to find answers. Discusses obvious risks, uses senses and simple equipment to collect information and measurements safely. Sorts and presents data using drawings, charts, and photographs; describes what was done and what happened orally. Recognises patterns and links to the original question, relates findings to everyday experiences, suggests improvements, and shares new knowledge.		<u>With support and within a context:</u> Works with others to identify scientific questions, make predictions, and follows safe procedures for investigations. Collects, observations and measurements using appropriate equipment and units while ensuring safety. Organises and presents data using tables, charts, and diagrams with labels and scales; structures simple reports or presentations. Identifies patterns and relationships, interprets findings, relates them to the wider world, reports limitations, and suggests improvements.	<u>With support:</u> Begins to formulate scientific questions, make predictions, identify what needs to be changed or kept the same, and designs safe procedures for investigations. Makes careful observations and measurements using the appropriate equipment and units, keep the test fair, and follow the steps. Organises results clearly using tables, charts, and labelled diagrams, and structures simple reports or presentations. Identifies patterns and relationships in the data, explains what findings might mean in real-world contexts, recognises limitations in the investigation, and suggests improvements.		<u>With support:</u> Formulates scientific questions and predictions, identifies variables, anticipates risks, and applies safety measures. Collects observations and measurements accurately using appropriate equipment and units, manages controlled variables, and follows procedures. Records and organises data, identifies relationships, draws conclusions linked to predictions, relates findings to the wider world, and suggests improvements while recognising errors. Uses a range of tables, charts, and graphs; structures reports collaboratively or individually; summarises findings with headings; and uses scientific vocabulary with sources acknowledged.
	Scientific analytical thinking skills	Shows awareness of science issues and problems by: - asking simple questions - exploring materials - expressing preferences.	Demonstrates curiosity, creative thinking, and reasoning (scientific learning) by: - asking simple questions - making simple predictions - suggesting solutions - explaining choices in familiar contexts.	Demonstrates scientific learning to develop creative solutions by: -Observing and asking questions -Making and sharing simple predictions -Making models -solving problems, making and testing predictions -providing simple explanations		Uses scientific learning and provides creative solutions by: - designing models - solving problems - making and testing predictions - giving evidence-based explanations.	Applies scientific thinking skills to solve problems with familiar contexts. Provides solutions that start to demonstrate creative thinking through the engineering process (design, construct, test and modify).		Applies scientific analytical thinking skills and scientific knowledge to solve problems with less familiar (or familiar but more complex) contexts. Provide solutions using some creative thinking through the engineering process (design, construct, test and modify).
	Skills and attributes of scientifically literate citizens	Talks about science during everyday experiences and listens to the views of others. Begins to show respect for living things and the environment.	Communicates a developing understanding of science and its impact by respecting living things and the environment, recognising science in everyday experiences, and exploring its role in different jobs.	Demonstrates basic understanding of scientific concepts and terminology, identifies simple links between science and everyday experiences, and recognises that science influences personal choices and society. Uses information from familiar sources to describe real-world science contexts.		Communicates personal views on scientific issues, connects science to health, wellbeing, and everyday experiences, shows awareness of personal and societal impact, and discusses real-world science contexts including media and careers.	Begins to develop and share evidence-based arguments that link to scientific and environmental issues. Demonstrates some understanding of the relevance of science to their future lives, careers and society.		Presents and shares a reasoned argument, based on evidence, demonstrating understanding of underlying science, engaging with the view of others. Demonstrates understanding of the relevance of science to their future lives, careers, and society. Demonstrates increased awareness of creativity, inventiveness, technology, and impact of science on society.

		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Planet Earth	Biodiversity and interdependence	Describes one way a plant or animal depends on another living thing. Begins to describe what a plant needs to grow and stay alive.	Explores and sorts objects as living, non-living or once living. Describes characteristics of livings things and how they depend on each other, for example, animals which depend on plants for food. Explores, observes and discusses basic needs of plants and what they need to grow including water, heat, sunlight and soil. Demonstrates understanding of how plants grow from seeds.	Recognises obvious differences between living and non-living things (e.g., things that move vs. things that don't). Identifies simple food chains showing the direction of energy flow from plants and animals. Begins to notice change over time (e.g., plants growing) without yet explaining why. Demonstrates curiosity about the natural world by asking simple questions like “Why does this grow?” or “Why does this move?”	Understands that living things carry out processes such as growth, reproduction, and how the living things responding to their environment. Learns how energy flows from plants to animals and identifies producers and consumers. Observes stages beyond germination, including flowering and seed dispersal. Begins to explore how living things adapt to their environment and depend on each other for survival.	Explains the difference between living and non-living things, taking into consideration movement, reproduction, sensitivity, growth, excretion, and feeding. Sorts living things into plants, animals and other groups using a variety of features. Creates criteria for sorting living things and justifies decisions. Demonstrates awareness of how energy from the sun can be taken in by plants to provide the major source of food for all living things. Interprets and constructs a simple food chain, using vocabulary such as ‘producer’, ‘consumer’, ‘predator’ and ‘prey’. Observes, collects and measures the outcomes from growing plants in different conditions, for example, by varying levels of light, water, air, soil/nutrients and heat. Structures a presentation or report, with support, to present findings on how plants grow.	Recognises variation within plants and animals – e.g., flowering vs non-flowering plants, vertebrates vs invertebrates. Observes and compares organisms based on visible characteristics to classify them logically. Begins to use and understand new terminology including habitat, ecosystem, herbivore, carnivore, omnivore, energy flow, adaptation, interdependence, extinction. Begins to interlink single food chains into simple food webs which show more than one consumer. Identifies basic plant parts and functions – roots, stems, leaves, flowers.	Begins to classify living things beyond plants and animals – micro-organisms (fungi, bacteria). Begins to use simple keys to identify particular plants and animals. Begins to identify and discuss characteristics of living things which help them survive in different environments. Begins to compare and contrast different ecosystems including living (organisms) and non-living factors (e.g., climate). Develops knowledge of more complex food webs, moving from simple chains to interconnected systems. Investigates different uses of plants and recognises the benefits to society and the environment. Recognises the use of different fertilisers (natural and artificial). Begins to explore the process of photosynthesis and respiration, linking to energy transfer.	Classifies living things into plants (flowering and non-flowering), animals (vertebrates and invertebrates) and other groups through knowledge of their characteristics. Begins to construct and use simple branched keys which can be used to identify particular plants or animals. Identifies characteristics of living things and their environment which have contributed to the survival or extinction of a species. Describes how some plants and animals have adapted to their environment, for example, for drought or by using flight. Describes how energy flows between plants and animals in more complex food chains and webs and ecosystems, using vocabulary such as ‘producers’, ‘consumers’ and ‘herbivore’. Relates findings from practical investigations to describe how plants have benefited society, for example, in medicine, dyes, fuels, construction, prevention of soil erosion and by influencing the balance of gases in the air. Collaborates with others to present a reasoned argument, based on evidence, of the risks and benefits of using fertilisers, demonstrating understanding of the underlying scientific concepts.
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		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Planet Earth	Energy sources and sustainability	Recognises simple cause-and-effect and uses basic language to describe how their actions make objects move.	Ask questions and describes what can ‘make things go’, for example, batteries, wind-up toys and sunlight.	Explains how at least one energy source helps people or different living things in everyday life.	Identifies and names common sources of energy (e.g., sun, food, fuel, wind, water) and describes simple examples of how each is used.	Identify and talks about types of energy that we get from different energy sources, for example, light, sound, heat and electrical.	Begins to identify the common types of energy that occur in everyday appliances.	Begins to understand the difference between ‘useful’ and ‘wasted’ energy.	Demonstrates understanding of the law of conservation of energy (energy can be converted from one form to another but cannot be created or destroyed).
		Explores familiar toys and household items and notices simple cause-and-effect actions such as things lighting up, making sounds, moving or heating when used.	Talks about toys and common appliances and what they do when they work, for example, produce heat, light, movement or sound.	Describes what familiar toys and everyday appliances do by focusing on the type of energy or effect they produce (heat, light, movement, sound).	Begins to discuss the importance of different types of energy for everyday life.	Uses knowledge of different energy sources, for example, sun, food, fuel, wind and waves, to discuss the importance of different types of energy for everyday life and survival.	Describes how energy is transferred and transformed in simple everyday tasks or appliances e.g. torch: electrical → light.	Begins to identify ‘useful’ and ‘wasted’ energy conversions in simple, everyday energy transfers e.g. light bulb converting electrical energy to light (useful) and heat (wasted) energy.	Identifies the common types of energy (kinetic, potential, electrical, chemical, light, sound and heat) used in energy transfers and transformations that occur in everyday appliances.

		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Planet Earth	Space	Identifies differences between day and night.	Describes how the rotation of the Earth in relation to the sun gives us day and night. Talks about how the pattern of night and day changes over the course of a year.	Explores using models, how the Earth spins around its axis (one day - 24 hours) and orbits the sun (one year).		Describes how the Earth spins around its axis in 24 hours resulting in day and night. Observes and records the different patterns of movement of the moon and explains why the moon appears to have different shapes and positions in the sky at different times in a lunar month. Demonstrates understanding of how the Earth takes one year to completely orbit the sun. Demonstrates understanding of how the tilt of the Earth on its axis as it circles the sun causes the pattern of the seasons and changes to the number of daylight hours over the course of a year.	Explores our Solar System, it's planets, moons and star. Explores using models, how the planets orbit the sun. Compares and contrasts the time taken for different planets in our Solar System to orbit the sun. Models how the relative positions and motions of the sun, Earth and moon create lunar phases, eclipses, and predictable patterns within the lunar cycle.	Identifies the names of the planets in our Solar System and recognises their order from the sun, using simple facts to describe each one. Describes the basic structure of the Solar System, including the sun, planets, and the moon, and recognises how they move relative to each other (e.g. the Earth orbits the sun, and the moon orbits the Earth).	Reports collaboratively on the key features of the planets including size, distance from the sun, length of day, length of year, temperature, materials from which they are predominantly made and the number of moons. Uses simple models to communicate understanding of size, scale, time and relative motion within our Solar System, including how solar & lunar eclipses occur.
		Recognises the difference between day, month, year. Understands that the Earth rotates and travels around the sun. Recognises that daylight hours are longer in the summer months and shorter in the winter months.		Explores using models, the size and position of the Earth, moon and sun within our Solar System. Recognises the moon changes appearance (different phases) over the course of a lunar month. Using simple experiments and models, explores how the tilt of the Earth on its axis, as it orbits the sun, causes the pattern of seasons and changes to the number of daylight hours over the course of a year.					
		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Forces, electricity and waves	Forces		Explores and sorts toys and objects into groups according to whether they need to be pushed or pulled. Measures, using simple equipment, how the movement of an object is affected by the size of the force or the weight of the object. Demonstrates, through play, how a force can make an object stay still, start to move, speed up, slow down and change shape.	Explores a wider range of objects that move by pushing or pulling and begins to predict, test, and talk about how the force makes the object move. Measures, using simple equipment, how the movement of an object is affected by the size of the force or the weight of the object, with increasing confidence. Demonstrates through experimentation how forces can make objects stay still, start moving, speed up, slow down, or change shape.	Demonstrates how actions change movement (speed, distance, basic direction) using simple comparative language (faster, slower, further, harder to push). Investigates how materials can stretch, squash or twist. Explores how forces such as pushes, pulls and friction can start or stop an object, change its speed or direction, and compare how stronger or weaker forces have different effects. Explores different materials and objects, noticing their properties and describing how they behave when pushed, pulled or moved without yet identifying magnetic forces. Investigate how magnets can attract some materials and show that they can pull or push on objects without touching them.	Predicts and then investigates how a force can make an object change speed, direction or shape, and uses vocabulary such as pushing, pulling, stretching, squashing and twisting to describe forces. Investigates balanced forces and explains that if a push and pull are equal in strength and opposite in direction then there is no change in movement. Reports in writing, visually, orally how magnets exert a non-contact force on each other and attract certain materials. Demonstrates through practical activities that like poles repel and opposite poles attract. Gives at least two examples for how magnets are used in everyday life.	Investigates how more than one force can act on an object at the same time. Explores how objects move through air or water and notices that their shape or size can affect how quickly they fall or travel. Relates friction and air resistance to slowing down or moving objects. Compares and contrasts the movement of different objects and begins to suggest ways to improve the efficiency of motion. Observes falling objects and links to the force of gravity. Investigates how the poles of a magnet behave, showing that like poles repel and opposite poles attract, and can use this knowledge to solve simple practical problems. Investigates how magnetic strength varies across a magnet and uses this understanding to identify the strongest parts of a magnet and applies this knowledge in simple problem-solving tasks. Explores objects that can be rubbed to make them static and notices that they can pull together or push apart. Explores placing different objects in water and notices whether they float or sink. Using prior knowledge, begins to question why certain objects float or sink in water.	Describes friction as a force which opposes the motion of moving objects, for example, two solid surfaces rubbing against one another or a solid surface moving through air or water. Finds an association between air resistance (drag), the speed of the object being investigated and the surface area exposed to the air, making links to original predictions. Demonstrates understanding of how friction and air resistance can both be useful, for example, in braking systems, and also a problem, for example, causing moving parts to wear. Describes efficient movement as that which requires the least possible energy and suggests ways to improve efficiency in moving objects, for example, by streamlining. Measures gravitational force with a force meter or newton meter and records results using appropriate units (newtons). Explains how some objects may become electrically charged by rubbing two surfaces together and how the charges produce an electrostatic force. Investigates and demonstrates understanding that magnetic and electrostatic forces can both repel and attract. Describes practical applications of magnetic, electrostatic and gravitational forces, for example, magnetised needle in a compass. Explores the factors which affect floating, for example, the object's shape and the density of the material that the object is made of, and collates, organises and summarises findings with assistance.	

		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Forces, electricity and waves	Electricity	Explores and identifies objects that use electricity and those that do not, through hands-on investigation and discussion	Groups objects into those which get electricity either from mains electrical sockets or alternative sources, such as batteries and solar cells.	Explains how electricity powers different devices and begins to describe how life would change without it, showing an emerging understanding of its impact on comfort, communication and daily routines.	Explores how electrical toys and everyday devices work, noticing that they need a power source such as batteries, mains.	Builds simple circuits containing bulbs, switches, bells and batteries.	Builds simple circuits using basic components such as bulbs, switches, bells and batteries, and recognises when a circuit is complete or incomplete.	Builds and tests simple electrical circuits using an increasing range of components such as bulbs, batteries, switches and buzzers, and can explain when a circuit is complete or incomplete.	Designs and builds a variety of electrical circuits for differing purposes, using an increasing range of components.
		Notifies and comments on objects that use electricity in their environment (e.g., lights, TVs, chargers), showing awareness that some things need electricity to work.	Talks about the importance of electricity in their daily lives.					Identifies and uses the symbols used to denote different circuit components.	Draws circuit diagrams using appropriate symbols to denote a bulb, switch, motor, bell, buzzer, wires, cell and a battery.
		Shows awareness that some electrical items should not be touched or played with and begins to follow simple adult instructions when using or being near electrical equipment.	Identifies the risks that can be caused by electricity and recognises how to stay safe.	Applies understanding of electrical safety independently in everyday situations, explaining why certain actions are dangerous and suggesting safe alternatives (e.g., keeping water away from plugs, not overloading sockets, and using appliances correctly).				Demonstrates understanding that electrical energy can be transformed into different types of energy including light, heat, sound, and movement.	Describes how components in a circuit transfer energy into different forms.
		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Forces, electricity and waves	Vibrations and waves	Explores different objects and materials to discover the sounds they make, noticing simple differences such as loud/quiet or high/low.	Predicts, then investigates, ways to make sounds louder and quieter.	Explains why certain actions make sounds louder or quieter, using simple scientific language (e.g., “hitting it harder makes it louder” or “covering it makes it quieter”) and applies this understanding in new contexts or with unfamiliar sound-producing objects.	Understands that sounds are made when objects vibrate, know that vibrations travel through air to the ear, and recognises that different sound sources create different qualities of sound.	Demonstrates how sounds can be made higher or lower pitch by altering tightness, length, width or thickness or other physical characteristics of the sound source.	Describes how vibrations travel through different materials (air, solids, liquids) and begins to explain how the pitch or loudness of a sound can change depending on the size, speed, or strength of the vibration.	Explores how sounds can be heard in different situations (e.g., placing ear on a table, listening through a door, hearing sounds underwater) and begins to notice that sounds differ in different mediums.	Discusses and demonstrates through experiments how sound travels differently through air, water and solids.
		Explores and reacts to sounds in the environment, noticing when a sound occurs and showing curiosity about where it might be coming from.	Identifies different sources of sound.		Recognises that sounds are made when objects move, can identify different sound sources, and understand that sound travels from the source to the ear.	Explains that sound is caused by a vibration in a material.	Recognises the ear is the organ which detects sound.	Notifies and comments on simple differences in how well they can hear sounds in different situations (e.g., when facing away, covering ears, standing nearer or further away).	Explains how hearing is limited by a range of factors, for example, age, position, and flexibility (direction) of ears.
				Explains how different sounds are made, describing the actions or materials involved (e.g., “It makes a sound when you hit it” or “The strings vibrate”), and begins to compare how sounds from different sources are similar or different.			Explores how light behaves using simple observations (e.g., noticing shadows form when light is blocked, seeing light reflect from shiny objects, or observing distortions in curved surfaces like spoons or bottles).	Identifies the main parts of the ear and their associated functions.	Demonstrates and records, through practical investigations, that light travels in straight lines, can be reflected by highly polished surfaces and that curved faces can distort the image.

		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Biological systems	Body systems and cells	Recognises and names the five senses (sight, hearing, smell, taste and touch).	Identifies specific parts of the body related to each of the senses.	Explains how each sense and its corresponding body part helps us understand the environment and begins to describe situations where senses work together (e.g., using sight and touch to explore an object).	Identifies major external body parts and recognise that humans and other animals have internal structures that help them live, move, and grow. They understand that the body has organs with important functions and that some organs are protected inside the body.	Uses components to make simple models of a skeleton which identify the skull, spine, ribcage and some bones of the arms and leg and which show how the skeleton gives us support and protects our organs.	Explains the functions of different parts of the skeleton in more detail, including how bones, joints and muscles work together for movement, and begins to compare human skeletons with those of other animals to identify similarities and differences.	Recognises that the human body is made up of different organs that have specific jobs (e.g., the heart pumps blood, the lungs help us breathe) and begins to name a few body systems (such as the circulatory or digestive system).	The expectation is that at least two of the following body systems will be studied at Second Level covering the functions of the main organs and main preventable causes of disease. See Progression Pathways for full details.
		Explores the environment using their senses through play and everyday experiences, noticing sights, sounds, smells, tastes and textures.	Uses their senses to describe the world around them, giving examples of things they see, hear, smell, taste and feel.	Uses their senses more purposefully to compare and evaluate different features in the environment (e.g., describing how two materials feel different or how one sound is louder than another) and begins to explain how sensory information helps them make choices or decisions.	Recognises that some parts of the body act as protective coverings. They know that the skin covers the whole body and helps keep the inside of the body separate from the outside environment. Explains that their bodies need healthy food, physical activity, rest, and safe choices to stay well. Identifies simple examples of healthy and unhealthy habits and understand that lifestyle choices can affect how they feel and how their bodies work. Identifies the five senses and the body parts connected to each and understands that senses give us information about the world and help keep us safe. They can describe simple situations where senses are useful in everyday life. Understands that people can become unwell, recognise simple signs of being ill (e.g., feeling tired, sore, hot, or having a cough), and know that some illnesses can spread from person to person. Understands that some diseases can spread from person to person and are aware that basic hygiene practices (such as handwashing and covering coughs) help reduce this spread.	Describes the position and function of major organs including the brain, heart, lungs, stomach and bladder. Describes how skin, as an organ, provides a barrier to infection and helps to control our temperature. Structures a presentation or report, with support, on how to have a healthy lifestyle, for example, through a balanced diet, regular exercise, sufficient sleep and by avoiding substance misuse. Uses their senses to detect information and explains how they help to keep people safe. Investigates the reliability and limitations of the senses, for example, using taste tests, limits of sound, optical illusions and blind-fold games. Describes the symptoms of some common diseases including colds, mumps, measles, chicken pox and flu. Provides explanations, supported by evidence, of how some diseases spread and discusses ways in which some diseases can be prevented through good hygiene and vaccination.	Describes how major organs work together within body systems (e.g., circulatory, respiratory, digestive, nervous) and begins to describe how lifestyle factors such as diet, exercise and hydration can support the healthy functioning of these organs. Explains how the skin works together with other body systems (e.g., the immune system and circulatory system) to protect the body and begins to describe factors that can damage or support healthy skin, such as hygiene, hydration, sun protection and injury. Independently researches, organises and presents detailed information about healthy lifestyle choices, explaining how different factors (nutrition, physical activity, sleep, substance avoidance, mental wellbeing) interact to support overall health, and evaluates the reliability of sources used. Recognises simple situations where senses help them notice danger (e.g., hearing a loud alarm, seeing a hot surface). Notices that people may use their senses differently (e.g., someone who can't see might listen more carefully) and begins to recognise that some senses can help when another is not being used. Explains how common diseases are caused, how they spread, and identifies simple steps people can take to reduce transmission (e.g., hand-washing, vaccination, covering coughs), linking symptoms to ways the body tries to fight infection. Evaluates the effectiveness of different disease-prevention strategies (e.g., vaccination programmes, quarantine, hygiene routines, protective equipment) and explains why some methods work better for certain diseases than others, using scientific evidence to support conclusions.	Applies understanding of the senses to evaluate real-life safety situations, explaining which senses are most useful in different contexts (e.g., listening for alarms, smelling smoke, noticing hazards) and how using multiple senses together improves awareness and decision-making. Evaluates and explains why the senses can sometimes be misleading, drawing on evidence from investigations (e.g., how the brain interprets optical illusions, how background noise affects hearing, or how smell influences taste), and begins to discuss how humans use tools or technology to extend or enhance their senses. Notices and talks about how we need light to see and begins to observe simple changes in the eyes (e.g., pupils looking “big” in the dark or “small” in bright light). Recognises that microorganisms such as bacteria, viruses and fungi exist and can grow or spread, noticing simple examples (e.g., mould appearing on food or germs spreading by touch). Discusses microorganisms that can be helpful and are used in making certain foods (e.g., bread, cheese, yoghurt). Recognises that microorganisms can cause food to go mouldy or “go off,” and that some microorganisms live inside the body and help us stay healthy. Notices simple signs of decay in natural materials (e.g., mould on food, leaves breaking down, wood softening) and begins to understand that micro-organisms are involved.	Respiratory system Circulatory system Digestive system Reproductive system Skeletal system Describes how senses work individually or together to keep people safe from harm. Demonstrates understanding of how, if one sense is impaired, it can have an effect on the other senses, either positively or negatively. Describes how light enters the eye through the pupil and how the pupil changes size in dark/light conditions. Demonstrates understanding of how microorganisms, including bacteria, viruses and fungi, can multiply rapidly. Investigates and explains the action of some microorganisms used in food production, for example, yeast in bread and bacteria in yoghurt. Describes how some micro-organisms break down food causing it to be inedible or harmful if digested, and how others exist in the gut to break down food to aid digestion. Investigates, observes and records how microscopic organisms are necessary for the process of decomposition (the breaking down of dead material – decay).

		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Biological systems				Recognises that living things have features that make them similar to and different from one another and can identify simple physical characteristics in themselves and others. Recognises that living things of the same species share many similar features but also show natural variation in their characteristics and can identify observable similarities and differences between individuals. Recognises that living things have observable similarities and differences, and can identify simple features that vary between individuals (e.g., hair colour, height, markings on animals or plants)		Uses their own experiences to illustrate how inherited characteristics are passed from one generation to the next. Knows that genetic information determines characteristics such as colour of eyes and shape of petals. Demonstrates understanding of the variations within family groups	Begins to explain that inherited characteristics come from genetic information passed from parents to offspring and can distinguish between inherited traits and those influenced by the environment. Recognises that offspring can look similar to their parents and notices simple inherited features (e.g., eye colour, fur pattern). Notices and talks about simple differences between people (e.g., hair colour, height, favourite things) without yet distinguishing which characteristics are inherited and which are learned or chosen. Notices and comments on a range of human characteristics (e.g., hair colour, height, favourite activities), without yet distinguishing whether these traits are inherited or learned/ chosen.	Plants: Notices and names the basic parts of common flowers (e.g., petals, stem, leaves) and begins to observe insects visiting flowers, showing early awareness that they play a role in helping plants reproduce. Recognises that plants produce male and female parts and begins to understand that pollen must reach the female part of the flower for a seed to form. Recognises that once a flower has been pollinated, the petals may fall off and a small fruit or seed pod begins to grow, showing early awareness that changes happen after pollination. Observes that seeds can begin to grow when placed in soil or on damp materials and notices early changes such as the seed swelling or a small root appearing. Animals: Notices simple differences between animals (e.g., size, number of legs, body coverings) and begins to group them based on obvious features. Recognises that different vertebrate groups have their own basic life cycle patterns (e.g., some hatch from eggs, some are born live). Identifies and describes the basic life cycle of one familiar invertebrate (such as a ladybird or butterfly). Begins to explain how genetic information is passed from parents to offspring, recognise that offspring inherit a combination of traits from both parents, and explore how some characteristics are inherited while others are influenced by environmental factors. Begins to explain that variations within families occur because offspring inherit a mix of genetic information from both parents and can distinguish inherited characteristics from those shaped by environmental factors. Understands that living things have unique features that make them identifiable (e.g., no two animals or people look exactly the same)	Plants: Describes how pollination occurs when the male cell (pollen) lands on the stigma. Describes how fertilisation (sexual reproduction) occurs when the genetic information in the male cell fuses (joins) with the genetic information in the female cell. Describes how the fertilised ovule develops into a seed and how the ovary ripens to form a fruit. Investigates and explains how a seed germinates into a plant using water, oxygen, a food store and warmth. Animals: Identifies and compares the two distinct groups of animals – vertebrates and invertebrates. Researches the lifecycles of the five main types of vertebrates including fish (spawn), birds (eggs which are rigid but fragile), amphibians (spawn and metamorphosis), reptiles (leathery shelled eggs) and mammal (live young), and communicates findings using a range of media. Compares the lifecycles of some invertebrates, for example, ladybird and spider. Knows that genetics is the study of inherited characteristics and that inherited characteristics are carried on genes and can sometime skip a generation. Explores and categorises characteristics into inherited (eye and hair colour, height and right/left handedness) and non-inherited (native language spoken and favourite colour). Describes how every living thing has its own DNA fingerprint.
	Inheritance								

		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Materials	Properties and uses of substances	Handles and plays with a variety of materials, noticing simple differences in how they look and feel (e.g., hard/soft, shiny/dull). Identifies and describes simple physical properties of materials (e.g., strong, flexible, waterproof, rough, smooth) and begins to match materials to everyday objects.	Explores and sorts materials into different groups depending on their properties, for example, whether they are strong, smooth, rough and if they float or sink. Justifies the selection of appropriate materials for different uses based on their physical properties	Uses knowledge of material properties to explain why items belong in specific groups and begins to predict how unfamiliar materials will behave (e.g., whether they will float, absorb water or bend) based on their observed characteristics. Explains why certain materials are chosen for specific purposes, linking properties to function (e.g., "glass is transparent, so we use it for windows," "rubber is waterproof so it's good for boots").	Identifies and describe different materials based on simple observable properties (such as texture, hardness, flexibility, transparency, or absorbency) and can recognise that different objects are made from different materials to suit their purpose. Recognises and names a variety of everyday materials and can describe simple, observable features (e.g., colour, shape, size). Understands that different objects are made from different materials and can sort or group materials based on basic similarities and differences. Understands that some materials change when mixed with water or other liquids and can observe simple changes such as mixing, sinking, floating, or disappearing. Describes what happens when a solid is stirred into a liquid. Understands that some materials dissolve in liquids while others do not and can describe what happens when a solid is mixed into a liquid.	Classifies materials into natural and human-made (synthetic). Identifies properties of different materials, for example, rigidity, flexibility, rough, smooth and waterproof, and their uses linked to their properties. Links new knowledge of dissolving to real-life examples of things that dissolve and things that don't dissolve. Predicts, investigates and records how solubility is affected by heat and stirring.	Begins to identify and compare the properties of natural and synthetic materials (such as flexibility, durability, waterproofing, transparency, and strength) and explains how these properties make certain materials suitable for particular uses. Explores everyday examples where materials change permanently (e.g., bread to toast, steel wool rusting, paper burning) and begins to notice that these changes cannot be undone. Observes simple changes of state (e.g., ice turning to water, water disappearing from a puddle, steam from a kettle) and talks about what they see in everyday language. Begins to predict, investigate and record how different factors (such as temperature, stirring, and particle size) affect the rate at which materials dissolve and explains their findings using scientific language. Explores mixtures of different solids through hands-on play and begins to notice that some materials can be separated more easily than others (e.g., picking out large pieces by hand).	Explores simple physical changes by observing what happens when materials are heated, cooled, mixed or dissolved, noticing that they can look or feel different afterward. Begins to investigate how materials can change (e.g., melting, freezing, dissolving, mixing), recognises which changes are reversible or irreversible, and explains how these changes affect the material's properties and potential uses. Engages in simple explorations where materials are mixed, heated or combined, noticing that some materials change in unexpected ways (e.g., fizzing tablets in water, colour changes in food, heat from hand warmers). Experiments with a range of materials and notices simple differences in how they behave (e.g., some stay in one shape, some can be poured, some spread out into the air). Explores simple mixtures of insoluble solids and begins to recognise that different tools (e.g., sieves, filters, magnets) can separate materials. Observes that some solids disappear when mixed with a liquid (dissolve) while others do not and begins to recognise that once a solid has dissolved, it cannot be removed by simple filtering. Explores what happens when solids are mixed with liquids and describes these changes using everyday language (e.g., "it disappears," "it mixes in," "it stays solid"). Describes what happens during simple dissolving investigations (e.g., which solids dissolved fastest or which solutions were easiest to mix). Explores how different conditions affect dissolving by observing simple patterns (e.g., noticing that warm water or stirring helps something dissolve faster). Carries out simple dissolving activities and begins to notice that some substances dissolve faster than others. Recognises that dissolving can happen at different speeds and begins to describe these differences based on simple observations in class investigations.	Investigates and explains physical changes to the properties of materials which are fully and partially reversible, for example, salt dissolving in water, chocolate melting and water freezing. Uses scientific vocabulary such as 'melting', 'freezing', 'evaporating' and 'condensing' to describe changes of state. Investigates and records chemical changes to the properties of materials which are irreversible, for example, cooking, rusting and striking a match. Observes and identifies some of the signs of a chemical reaction, for example, production of bubbles, colour/texture change and heat given out/taken in. Explores and describes the characteristics of solids, liquids and gases, for example, solids retain the same volume and shape, liquids keep the same volume but the shape changes to fit the container and that gases change shape and volume to fill the container. Draws on findings from practical investigations to explain how a mixture of solids of different sizes can be separated using a sieve or magnet, for example, sand and peas or salt and iron filings. Selects the most appropriate practical technique for separating insoluble solids, for example, filtering or sieving. Explains why a dissolved solid cannot be separated from the solvent by filtering but can be separated by evaporation. Uses scientific vocabulary such as 'soluble', 'insoluble', 'dissolve' and 'solution' in context. Relates findings of practical investigations about dissolving to everyday experiences, for example, recycling, salt production and water purification. Finds an association between the quantity of substance that dissolves and a range of conditions – temperature, time, particle size, stirring and quantity of solvent. Investigates how a range of factors such as particle size and heat can affect the rate of dissolving. Relates learning about the quantity and rate of dissolving to everyday examples such as dissolving sugar in tea or salt in water (granules or big crystals, hot or cold liquid, stirred or not stirred).

		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Materials	Earth' s materials						Observe, describe and sort rocks, soils and minerals using simple, visible features such as colour, texture, hardness, and grain size. Understands that different materials come from the Earth and can identify basic examples of rocks, soils, and minerals in their environment.		Analyses and compares samples of rocks, soil and minerals and reports their characteristics and uses, using a range of media.
		Early		First			Second		
		Phase 1 – Prerequisite	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Materials	Chemical changes						Understands and describes the key stages of the water cycle—evaporation, condensation, precipitation, and collection—and recognise that water continually moves between the sea, land and air in a repeating cycle. Understands that water collected from the environment may contain impurities and that not all water is safe to drink. Knows that water can be changed by processes such as evaporation and condensation and describes the basic stages of the water cycle. Understands that water is a limited and valuable resource and know some everyday examples of how water is used in the home, school and wider environment. Recognises that wasting water has consequences and shows an awareness that people and animals depend on clean water to survive. Understands that water is essential for life and recognise everyday ways in which water is used in the home, school and community (e.g., drinking, washing, cleaning, watering plants). Shows awareness that water exists in different forms—liquid, solid and gas—and that it can change state. Observes change that happened when materials are mixed (e.g., colour change, fizzing, temperature change, new smell) and understands that some changes are reversible while others are not. Knows basic classroom safety rules when handling materials and equipment. Identifies observable signs that a material has undergone a change—for example colour change, fizzing, heat being produced, or a new smell. Understands that some changes are reversible (like melting or freezing) and others are irreversible (like burning or rusting). Observes and describes simple changes when materials are mixed or heated and recognises key signs that a chemical reaction may have occurred—such as fizzing, colour change, heat production, or a new smell. Demonstrates understanding that some changes are reversible while others are not.		Uses knowledge of the water cycle to explain how the quantity of water on the Earth has remained approximately the same. Investigates and discusses the methods used to purify water, for example, sedimentation, filtration, evaporation, desalination and the addition of chemicals such as chlorine. Researches methods used to conserve water within the home, school and globally and communicates findings to others. Discusses the many uses of water, for example, to support all living things, in preservation (ice) and to generate electricity. Collaborates with others to safely demonstrate simple chemical reactions, for example, effervescence. Investigates examples of everyday chemical reactions, such as burning and corrosion, and names some of the new substances which are produced. Uses prior knowledge to identify when a chemical reaction has occurred to produce a new substance.

