Leamington Federation
Sydenham Primary School
Science Progression of knowledge and skills

Subject Leader: Kate Gillespie
Executive Head Teacher: Juliette Westwood
Sydenham Associate Head Teachers: Carol Glenny
Lighthorne Heath Associate Head Teacher: Jill Manley

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Humankind	Human body	Self-Regulation Children at the expected level of development will: - Show an understanding of their own feelings and those of others, and begin to regulate their behaviour accordingly; - Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate; - Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions	The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. The five senses are hearing, sight, smell, taste and touch. Ears are used for hearing, eyes are used to see, the nose is used to smell, the tongue is used to taste and skin gives the sense of touch. Draw and label the main parts of the human body and say which body part is associated with which sense.	Human offspring go through different stages as they grow to become adults. These include baby, toddler, child, teenager, adult and elderly. Describe the stages of human development (baby, toddler, child, teenager, adult and elderly).	Humans have a skeleton and muscles for movement, support and protecting organs. Major bones in the human body include the skull, ribs, spine, humerus, ulna, radius, pelvis, femur, tibia and fibula. Major muscle groups in the human body include the biceps, triceps, abdominals, trapezius, gluteals, hamstrings, quadriceps, deltoids, gastrocnemius, latissimus dorsi and pectorals. Describe how humans need the skeleton and muscles for support, protection and movement.	he digestive system is responsible for digesting food and absorbing nutrients and water. The main parts of the digestive system are the mouth, oesophagus, stomach, small intestines, large intestines and rectum. The mouth starts digestion by chewing food and mixing it with saliva. The oesophagus transports the chewed food to the stomach, where it mixes with stomach acid and gets broken down into smaller pieces. In the small intestine, nutrients from the food are absorbed by the body. In the large intestine, water is absorbed by the body. The remaining undigested waste is stored in the rectum before excretion	Humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents. Describe the process of human reproduction.	The circulatory system includes the heart, blood vessels and blood. The heart pumps blood through the blood vessels and around the body. There are three types of blood vessel: arteries, veins and capillaries. They each have a different-sized hole (lumen) and walls. The blood carries gases (oxygen and carbon dioxide), water and nutrients to where they are needed. The red blood cells carry oxygen and carbon dioxide around the body. The blood also contains white blood cells, which protect the body from infection. Name and describe the purpose of the circulatory system and the functions of the

		involving several ideas or actions. PP				through the anus. Describe the purpose of the digestive system, its main parts and each of their functions.		heart, blood vessels and blood.

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Humankind	Staying safe	Gross Motor skills: Negotiate space and obstacles safely, with consideration for themselves and others. Fine Motor skills: Use tools such as scissor safely. Understand the importance of our own bodies and identify our early warning signs– Protective Behaviours.	It is important to stay safe. Some ways to stay safe include staying safe in strong sunlight (sun cream, sun hat and sunglasses), crossing roads (stop, look and listen), in the kitchen (not touching hot or sharp objects) and with household chemicals (not touching, drinking or eating). Describe ways to stay safe in some familiar situations.	Humans need water, food, air and shelter to survive. Describe what humans need to survive.	Light from the Sun is damaging for vision and the skin. Protection from the Sun includes sun cream, sun hats, sunglasses and staying indoors or in the shade. Explain why light from the Sun can be dangerous.	Working with electrical circuits can be dangerous. Precautions include not touching electrical components with wet hands and not putting batteries in mouths. Explain the precautions needed for working safely with electrical circuits.	Very hot and very cold materials can burn skin. Heating materials should be done safely. Explain the precautions needed for working safely when heating, burning, cooling and mixing materials.	Lasers are intense beams of light and they should never be pointed at people's faces or aircraft. Explain the dangers of using lasers and ways to use them safely.
	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Healthy Lifestyle	Managing self: Manage their own basic hygiene and personal needs, including	Hand washing and good hygiene are important parts of a healthy lifestyle and prevent the spread of germs.	A healthy lifestyle includes exercise, good personal hygiene, good quality sleep and a balanced diet. Risks associated with an unhealthy	Humans have to get nutrition from what they eat. It is important to have a balanced diet made up of the main food groups, including proteins,	Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene. Describe what damages teeth	Good personal hygiene (washing, wearing clean clothes and brushing teeth) can prevent disease or illness. Puberty is the period during	Lifestyle choices can have a positive (exercise and eating healthily) or negative (drugs, smoking and alcohol) impact on the body. Explain

		dressing, going to the toilet and understanding the importance of healthy food choices.	Explain why hand washing and cleanliness are important.	lifestyle include obesity, tooth decay and mental health problems. Describe the importance of a healthy lifestyle, including exercise, a balanced diet, good quality sleep and personal hygiene.	carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans need to stay hydrated by drinking water. Explain the importance and characteristics of a healthy, balanced diet.	and how to look after them.	which adolescents reach sexual maturity and become capable of reproduction. It causes physical and emotional changes. Explain why personal hygiene is important during puberty.	the impact of positive and negative lifestyle choices on the body.

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Processes	Pattern seeking	Patterns: Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally. The Natural world: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	There are four seasons: spring, summer, autumn and winter. Certain events and weather patterns happen in different seasons. Observe changes across the four seasons.	The UK has typical weather in each of the seasons. For example, winter is cold and sometimes frosty, whereas summer is warm and sometimes sunny. Describe typical UK seasonal weather patterns.	Shadows change shape and size when the light source moves. For example, when the light source is high above the object, the shadow is short and when the light source is low down, the object's shadow is long. Find patterns in the way shadows change during the day.	Pitch is how high or low a sound is. Parts of an instrument that are shorter, tighter or thinner produce high-pitched sounds. Parts of an instrument that are longer, looser or fatter produce low-pitched sounds. Compare and find patterns in the pitch of a sound, using a range of equipment, such as musical instruments. Volume is how loud or quiet a sound is. The harder an instrument is hit, plucked or blown, the stronger the vibrations and the louder the sound. Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments.	As Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin. During the day, the Sun appears to move through the sky. However, this is due to the Earth rotating and not the Sun moving. Earth rotates to the east or, if viewed from above the North Pole, it rotates anti-clockwise, which means the Sun rises in the east and sets in the west. As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time. Use the idea of Earth's rotation to explain day and night, and the Sun's apparent	A shadow appears when an object blocks the passage of light. Apart from some distortion or fuzziness at the edges, shadows are the same shape as the object. The distortion or fuzziness depends on the position or type of light source. Explain, using words, diagrams or a model, why shadows have the same shape as the objects that cast them and how shadows can be changed.

							movement across the sky.	
	Changes	Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Understand some important processes and changes in the natural world around them, including the seasons and	Day length (the number of daylight hours) is longer in the summer months and shorter in the winter months. Observe and describe how day length changes across the year.	Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay. Describe how some objects and materials can be changed and how these changes can be desirable or undesirable.	Fossils form over millions of years and are the remains of a once-living organism, preserved as rock. Scientists can use fossils to find out what life on Earth was like in prehistoric times. Fossils form when a living thing dies in a watery environment. The body gets covered by mud and sand and the soft tissues rot away. Over time, the ground hardens to form sedimentary rock and the skeletal or shell remains turn to rock. Describe simply how fossils are formed, using words, pictures or a model.	Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. The temperature at which materials change state varies depending on the material. Water changes state from solid (ice) ⇌ liquid (water) at 0°C and from liquid (water) ⇌ gas (water vapour) at 100°C. The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The	Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions. Identify, demonstrate and compare reversible and irreversible changes.	Describe some significant changes that have happened on Earth and the evidence, such as fossils, that support this.

		changing states of matter.				reverse process of changing from a gas to a liquid is called condensation. Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius (°C) at which materials change state.		
	Earth	Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps.	Different types of weather include sunshine, rain, hail, wind, snow, fog, lightning, storm and cloud. The weather can change daily and some weather types are more common in certain seasons, such as snow in winter. Observe and describe different types of weather.	The Earth is spherical and is covered in water and land. When it is daytime in one location, it is night time on the other side of the world. Describe features of Earth using words and pictures.	Soils are made from tiny pieces of eroded rock, air and organic matter. There are a variety of naturally occurring soils, including clay, sand and silt. Different areas have different soil types. Investigate soils from the local environment, making comparisons and identifying features.	The water cycle has four stages: evaporation, condensation, precipitation and collection. Water in lakes, rivers and streams is warmed by the Sun, causing the water to evaporate and rise into the air as water vapour. As the water vapour rises, it cools and condenses to form water droplets in clouds. The clouds become full of water until the water falls back to	The Solar System is made up of the Sun and everything that orbits around it. There are eight planets in our Solar System: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Earth orbits around the Sun and a year (365.25 days) is the length of time it takes for Earth to complete a full orbit. Describe or model the movement of the planets in our Solar	Light travels in straight lines. Identify that light travels in straight lines. Light sources give out light. They can be natural or artificial. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source or reflected light enter the eye. Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and

						the ground as precipitation (rain, hail, snow and ice). The fallen water collects back in lakes, rivers and streams. Evaporation and condensation are caused by temperature changes. Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation.	System, including Earth, relative to the Sun. The Moon orbits Earth, completing a full orbit every month (27.3 days). Describe or model the movement of the Moon relative to Earth.	focuses it on the nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve. Explain that, due to how light travels, we can see things because they give out or reflect light into the eye.
	Phenomena	The natural world: Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.	A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object, but not by transparent objects. Explain in simple terms how shadows are formed.	When an instrument is played by plucking, striking or blowing, the air around or inside it vibrates. These vibrations travel as a sound wave to the ear. Explain in simple terms how sounds are made.	Dark is the absence of light and we need light to be able to see. Describe the differences between dark and light and how we need light to be able to see. A shadow is formed when light from a light source, such as the Sun, is blocked by an object. Opaque	When an instrument is played, the air around or inside it vibrates. These vibrations travel as a sound wave. Sound waves travel through a medium, such as air or water, to the ear. Explain how sounds are made and heard using diagrams, models, written methods or	The Sun, Earth, Moon and the planets in our solar system are roughly spherical. All planets are spherical because their mass is so large that they have their own force of gravity. This force of gravity pulls all of a planet's material towards its centre, which compresses it	'White' light is a term used to describe visible, ordinary daylight. White light can be split into a spectrum of colours (rainbow) by droplets of water or prisms. Describe, using scientific language, phenomena associated with refraction of light.

					objects cast dark shadows. Translucent objects cast pale shadows. Transparent objects cast very pale shadows. Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object.	verbally.	into the most compact shape – a sphere. Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses.	
	Forces		Simple equipment can be used for measuring weather, such as measuring temperature with a thermometer; identifying wind direction and force with a windsock or measuring rainfall with a rain gauge. Investigate weather using toys, models or simple equipment.	Some objects float and others sink. Objects that float are typically light or hollow. Objects that sink are typically heavy or dense. Sort and group objects that float and sink.	An object will not move unless a pushing or pulling force is applied. Some forces require direct contact, whereas other forces can act at a distance, such as magnetic force. Explain that an object will not move unless a push or pull force is applied, describing forces in action and whether the force requires direct contact or whether the force can act at a	A series circuit is a simple loop with only one path for the electricity to flow. A series circuit must be a complete loop to work and have a source of power from a battery or cell. Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell.	Gravity is a force of attraction. Anything with a mass can exert a gravitational pull on another object. The Earth's large mass exerts a gravitational pull on all objects on Earth, making dropped objects fall to the ground. Explain that objects fall to Earth due to the force of gravity.	Voltage is measured in volts (V) and is a measure of the difference in electrical energy between two parts of a circuit. The bigger the voltage, the more electrons are pushed through the circuit. The more voltage flowing through a lamp, buzzer or motor, the brighter the lamp, the louder the buzzer and the faster the motor. Explain how the brightness of a lamp or volume of a

					distance (magnetic force).			buzzer is affected by the number and voltage of cells used in a circuit.
	Modelling	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; - Share their creations, explaining the process they have used; - Make use of props and materials when role playing characters in narratives and stories.	Electrical circuits can light lamps or sound a buzzer. A switch turns an electrical circuit off and on. Describe, following exploration, what simple electrical circuits can do.	Models can have moving parts that use levers, sliders, wheels and axles. Make models with moving parts.	Make working models with simple mechanisms or electrical circuits.	Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control. Construct operational simple series circuits using a range of components and switches for control.	Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. A mechanical advantage is a measurement of how much a simple machine multiplies the force that we put in. The bigger the mechanical advantage, the less force we need to apply. Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects.	There are recognised symbols for different components of circuits. Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components.

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Creativity	Report and conclude	Expressive arts and design - Share their creations, explaining the process they have used. Speaking - Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher.	The results are information that has been found out from an investigation. Talk about what they have done and say, with help, what they think they have found out.	The results are information that has been found out from an investigation and can be used to answer a question. Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language.	Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.	Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected. Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.	The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected. Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions.	The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence. Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further questions and make predictions for what they might observe.

	Gather and record data	Data can be displayed as tally charts, pictorial forms. With support, the use of simple diagrams can be used.	Data can be recorded and displayed in different ways, including tables, pictograms and drawings. With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams).	Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy.	Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.	Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams. Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).	Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams. Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). covered x 8optional x 7	Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams. Choose an appropriate approach to recording accurate results, including scientific diagrams, labels, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge.

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Investigation	Questioning	Ask who, what, where, when questions. Adults to promote questioning during continuous provision.	Question words include what, why, how, when, who and which. Ask simple scientific questions.	Questions can help us find out about the world. Ask and answer scientific questions about the world around them.	Questions can help us find out about the world and can be answered in different ways. Ask questions about the world around them and explain that they can be answered in different ways.	Questions can help us find out about the world and can be answered using scientific enquiry. Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them.	Questions can help us find out about the world and can be answered using a range of scientific enquiries. Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them.	Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation. Ask and answer deeper and broader scientific questions about the local and wider world that build on and extend their own and others' experiences and knowledge.
	Measurement	Use simple tools such as tools e.g. tape, rulers, cubes, our own bodies, counters to measure. This is evident through Power Maths and continuous provision.	Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses. With support, use simple equipment to measure and make observations.	Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels. Use simple equipment to measure and make observations.	Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.	Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres). Take accurate measurements in	Specialised equipment is used to take measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres). Take	Specialised equipment is used to take accurate measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C) and measuring tapes (millimetres, centimetres, metres). Take accurate,

					Take measurements in standard units, using a range of simple equipment.	standard units, using a range of equipment.	increasingly accurate measurements in standard units, using a range of chosen equipment.	precise and repeated measurements in standard units, using a range of chosen equipment.
	Investigation	Carry out simple investigations derived from the E-Bug curriculum. Following simple instructions and talk about what might happen next.	Simple tests can be carried out by following a set of instructions. With support, follow instructions to perform simple tests and begin to talk about what they might do or what might happen.	Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation. Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions.	Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.	Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and	A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding. Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding.	A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding. Plan and carry out a range of enquiries, including writing methods, identifying and controlling variables, deciding on equipment and data to collect and

						following a method accurately.		making predictions based on prior knowledge and understanding.
	Observation	Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class - Understand some important processes and changes in the natural world around them, including the seasons and	Objects, materials and living things can be looked at and compared. Observe objects, materials, living things and changes over time, sorting and grouping them based on their features.	Objects, materials and living things can be looked at, compared and grouped according to their features. Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their	An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.	An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time. Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.	An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time. Within a group, decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect.	An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons. Independently decide which observations to make, when and for how long and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect.

		changing states of matter.						
Materials	Identification and classification	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; - Share their creations, explaining the process they have used.	A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric. Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock.	Some foods, such as ice and chocolate, melt when heated, but then harden (solidify or freeze) when cooled. Observe what happens when a range of everyday materials, including foods, are heated and cooled, sorting and grouping them based on their observations.	Light can be reflected from different surfaces. Some surfaces are poor reflectors, such as some fabrics, while other surfaces are good reflectors, such as mirrors. Group and sort materials as being reflective or non-reflective.	Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay. Liquids move around (flow) easily and are difficult to hold. Liquids take the shape of the container in which they are held. Examples of liquids include water, juice and milk. Gases spread out to fill the available space and cannot be held. Examples of gases include oxygen, helium and carbon dioxide. Air is a	Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating. Explain, following observation, that some substances (solutes) will dissolve in liquid	Heat energy is transferred in three different ways: conduction, convection and radiation. A material that allows heat energy to travel through it is a thermal conductor. Poor thermal conductors are known as thermal insulators. Insulation is important for the survival of many animals. Blubber is a layer of fat that acts as an insulator under the skin of some animals, such as walruses and whales. It is an adaptation that is essential for their survival. Animals with fur, such as polar bears and Arctic foxes, trap a layer of air close to their skin to insulate them from the cold. Investigate and identify good

						mixture of gases. Group and sort materials into solids, liquids or gases.	(solvents) to form a solution and the solute can be recovered by evaporating off the solvent.	thermal insulators, describing their common features.
	Properties and uses	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; - Share their creations, explaining the process they have used.	Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof. Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid and waterproof or not waterproof. covered x 3optional	A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Many materials are used for more than one purpose, such as metal for cutlery and cars. Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard.	There are three different rock types: sedimentary, igneous and metamorphic. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Examples include sandstone and limestone. Igneous rocks are made from cooled magma or lava. They usually contain visible crystals. Examples include pumice and granite. Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth's crust or	Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. Common insulators include wood, glass, plastic and rubber. Describe materials as electrical conductors or insulators.	Some mixtures can be separated by filtering, sieving and evaporating. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. Evaporating can be used to separate dissolved solids from liquids. Separate mixtures by filtering, sieving and evaporating. A material's properties dictate what it can be used for. For example, cooking pans are made from metal, which is a good thermal conductor, allowing heat to quickly transfer from the hob to the	Mirrors and lenses are used in a range of everyday objects (telescopes, periscopes, cards and on roads). The human eye has a lens that bends and focuses light on the back of the eye (retina) so that we can see. Describe, using diagrams, how light behaves when reflected off a mirror (plane, convex or concave) and when passing through a lens (concave or convex).

					squashed by the movement of the Earth's tectonic plates. They are usually very hard. Examples include slate and marble. Compare and group rocks based on their appearance, properties or uses. Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. Iron is a magnetic metal. Compare and group materials based on their magnetic properties.		contents of the pan. Describe, using evidence from comparative or fair tests, why a material has been chosen for a specific use, including metals, wood and glass.	
	Identification and classification	The natural world: Know some similarities and differences between the	Plants are living things. Common plants include the daisy, daffodil and grass. Trees are	A habitat is a place where a living thing lives. A microhabitat is a very small habitat. Identify	Some animals have skeletons for support, movement and protection. Endoskeletons are	Scientists classify living things according to shared characteristics. Animals can be	Flowering plants reproduce sexually. The flower is essential for sexual reproduction. Other plants reproduce	Classification keys help us identify living things based on their physical characteristics. Use and construct

Nature		natural world around them and contrasting environments, drawing on their experiences and what has been read in class.	large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees. Examples include oak, beech and rowan. Trees that shed old leaves and grow new leaves all year round are called evergreen trees. Examples include holly and pine. Identify, compare, group and sort a variety of common wild and garden plants, including deciduous and evergreen trees, based on observable features. Animals are living things. Animals can be sorted and grouped into six	and name a variety of plants and animals in a range of habitats and microhabitats. Animals have offspring that grow into adults. Different animals have different stages of growth or life cycles. Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog).	those found inside some animals, such as humans, cats and horses. Exoskeletons are those found on the outside of some animals, such as beetles and flies. Some animals have no skeleton, such as slugs and jellyfish. Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton).	divided into six main groups: mammals, reptiles, amphibians, birds, fish and invertebrates. These groups can be further subdivided. Classification keys are scientific tools that aid the identification of living things. Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour.	asexually. Bulbs, corms and rhizomes are some parts used in asexual reproduction in plants. Group and sort plants by how they reproduce.	classification systems to identify animals and plants from a range of habitats. Scientists classify living organisms into broad groups according to their characteristics. Vertebrates are an example of a classification group. There are a number of ranks, or levels, within the biological classification system. The first rank is called a kingdom, the second a phylum, then class, order, family, genus and species. Classify living things, including microorganisms, animals and plants, into groups according to common observable characteristics and based on similarities and differences.

			main groups: fish, amphibians, reptiles, birds, invertebrates and mammals. Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features.					
	Parts and functions	Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting	The basic plant parts include root, stem, leaf, flower, petal, fruit, seed and bulb. Trees have a woody stem called a trunk. Label and describe the basic structure of a variety of common plants. Different animal groups have	Plants need water, light and a suitable temperature to grow and stay healthy. Without any one of these things, they will die. Describe how plants need water, light and a suitable temperature to grow and stay healthy.	The plant's roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants. Name	There are four different types of teeth: incisors, canines, premolars and molars. Incisors are used for cutting. Canines are used for tearing. Premolars and molars are used for grinding and chewing. Carnivores, herbivores and omnivores have	Parts of a flower include the stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal. Pollination is when the male part of a plant (pollen) is carried, by wind, insects or other animals, to the female part of the plant (carpel). The pollen travels to the ovary, where it	Animals that sexually reproduce generate new offspring of the same kind by combining the genetic material of two individuals. Each offspring inherits two of every gene, one from the female parent and one from the male parent. Identify that living things produce offspring of the

		environments, drawing on their experiences and what has been read in class; - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	some common body parts, such as eyes and a mouth, and some different body parts, such as fins or wings. Label and describe the basic structures of a variety of common animals, including fish, amphibians, reptiles, birds and mammals.		and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers). Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem. Investigate how water is transported within plants.	characteristic types of teeth. Herbivores have many large molars for grinding plant material. Carnivores have large canines for killing their prey and tearing meat. Identify the four different types of teeth in humans and other animals, and describe their functions.	fertilises the ovules (eggs). Seeds are then produced, which disperse far away from the parent plant and grow new plants. Label and draw the parts of a flower involved in sexual reproduction in plants (stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal).	same kind, although the offspring are not identical to either parent. Animals and plants can be bred to produce offspring with specific and desired characteristics. This is called selective breeding. Examples include cows that produce large quantities of milk or crops that are disease-resistant. Describe how animals and plants can be bred to produce offspring with specific and desired characteristics (selective breeding).
	Nutrition	Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding	Carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants. Group and sort	Food chains show how living things depend on one another for food. All food chains start with a plant, followed by animals that either eat the	Animals cannot make their own food and need to get nutrition from the food they eat. Carnivores get their nutrition from eating other animals.	Food chains show what animals eat within a habitat and how energy is passed on over time. All food chains start with a producer, which is typically a green	Population changes in a habitat can have significant consequences for food chains and webs. Describe, using their knowledge of food chains and webs,	The role of the circulatory system is to transport oxygen, water and nutrients around the body. They are transported in blood and delivered to where they are

		the importance of healthy food choices.	a variety of common animals based on the foods they eat.	plant or other animals. Interpret and construct simple food chains to describe how living things depend on each other as a source of food.	Herbivores get their nutrition from plants. Omnivores get their nutrition from eating a combination of both plants and other animals. Compare and contrast the diets of different animals.	plant. The producer is eaten by a primary consumer (prey), which is eaten by a secondary consumer (prey), which is eaten by a tertiary consumer. All food chains end with a top or apex predator. Changes within a food chain, such as an abundance or lack of one food type, have an impact on the entire food chain. Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time.	what could happen if a habitat had a living thing removed or introduced.	needed. Explain that the circulatory system in animals transports oxygen, water and nutrients around the body.
	Survival	Manage their own basic hygiene and personal needs, including dressing, going to the toilet	Living things need to be cared for in order for them to survive. They need water, food, warmth and	Animals need water, food, air and shelter to survive. Their habitat must provide all these things. Explain	Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have	An adaptation helps an animal or plant survive in its habitat. If living things are unable to adapt to changes within	Reproduction is the process of producing offspring and is essential for the continued survival of a species. There are	An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche. Adaptations

		and understanding the importance of healthy food choices.	shelter. Describe how to care for plants and animals, including pets.	how animals, including humans, need water, food, air and shelter to survive.	different needs depending on their habitat. Examples include cacti, which need less water than is typical, and ferns, which can grow in lower light levels. Describe the requirements of plants for life and growth (air, light, water, nutrients and room to grow) and how they vary from plant to plant.	their habitat, they are at risk of becoming extinct. Explain how adaptations help living things to survive in their habitat.	two types of reproduction: sexual and asexual. Sexual reproduction involves two parents (one female and one male) and produces offspring that are different from the parents. Asexual reproduction involves one parent and produces offspring that is identical to the parent. Describe the life process of reproduction in some plants and animals.	evolve by natural selection. Favourable traits help an organism survive and pass on their genes to subsequent generations. Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that adaptations may lead to evolution.
Place and space	Habitats	Understanding the world- Explore the natural world around them, making observations and drawing pictures of animals and plants;	The local environment is a habitat for living things and can change during the seasons. Observe the local environment throughout the year and ask and answer questions about living things and	Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. All living things live in a habitat to which they are suited and it must	Environments are constantly changing due to natural influences, such as seasons, extreme weather, population changes and availability of food. Living things must adapt to these changes in order to survive. Describe how	Humans can affect habitats in negative ways, such as littering, pollution and land development, or positive ways, such as garden ponds, bird boxes and wildflower areas. Describe how environments can change due to human and	Farming in the UK can be divided into three main types: arable (growing crops), pastoral (raising livestock), mixed (arable and pastoral). Intensive farming in the past has resulted in the loss of habitats. Research and describe different farming practices in	living things are classified into groups, according to common observable characteristics and based on similarities and differences. Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification

			seasonal change.	provide everything they need to survive. Describe a range of local habitats and habitats beyond their locality (beaches, rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there.	environments can change due to natural influences and how living things need to be able to adapt to these changes.	natural influences and the impact this can have on living things.	the UK and how these can have positive and negative effects on natural habitats.	system.
Comparison	Physical things		Materials can be grouped according to their properties. Compare and group materials in a variety of ways, such as based on their physical properties; being natural or man-made and being recyclable or non-recyclable.	Living things are those that are alive. Dead things are those that were once living but are no longer. Some things have never been alive. Compare and group things that are living, dead or have never been alive.	Magnets have two poles (north and south). Opposite poles (north and south) attract each other, while like poles (north and north, or south and south) repel each other. Investigate and compare a range of magnets (bar, horseshoe and floating) and explain that magnets have two poles (north and south) and that opposite poles	Electricity is a type of energy. It is used to power many everyday items, such as kettles, computers and televisions. Electricity can also come from batteries. Batteries eventually run out of power and need to be recycled or recharged. Batteries power devices that can be carried around, such as mobile	A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death. Mammals' life cycles include the stages: embryo, juvenile, adolescent and adult. Amphibians' life cycles include the stages: egg, larva (tadpole), adolescent and adult. Some insects' (butterflies, beetles and bees) life cycles	Environmental factors can affect the distribution of living things within a habitat. These factors include light (intensity and duration), weather, altitude, soil type and humans, such as when we mow or trample grass. Compare the living things in two contrasting areas of a habitat (top vs bottom of a hill, full sun vs shade, exposed location vs sheltered location or

					attract each other, while like poles repel each other.	phones and torches. Compare common household equipment and appliances that are and are not powered by electricity.	include the stages: egg, larva, pupa and adult. Birds' life cycles include the stages: egg, baby, adolescent and adult. Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird.	well-trodden path vs unused area).
	Phenomena		Shadows are normally the same shape as the object that cast them. Shadows change during the day as the Sun appears to change position in the sky. Shadows occur where light is blocked by an opaque object. Compare shadows made by different objects and materials.	Volume is how loud or quiet a sound is. Pitch is how high or low a sound is. Compare the volume and pitch of sounds made by instruments, their voices or other objects.	Friction is a force between two surfaces as they move over each other. Friction slows down a moving object. Smooth surfaces usually generate less friction than rough surfaces. Compare how objects move over surfaces made from different materials.	Sounds are louder closer to the sound source and fainter as the distance from the sound source increases. Compare how the volume of a sound changes at different distances from the source.	Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects. These forces can be useful, such as bike brakes and parachutes, but sometimes we need to minimise their effects, such as streamlining boats and planes to move through water or air more easily and using lubricants and ball bearings between two surfaces to reduce friction. Compare and describe, using	A circuit needs a power source, such as a battery or cell, with wires connected to both the positive and negative terminals. Other components include lamps, buzzers or motors, which an electric current passes through and affects a response, such as lighting a lamp or turning a motor. When a switch is open, it creates a gap and the current cannot travel around the circuit. When a switch is closed, it completes

							a range of toys, models and natural objects, the effects of water resistance, air resistance and friction.	the circuit and allows a current to flow all the way around it. Compare and give reasons for variations in how components in electrical circuits function (brightness of lamps; volume of buzzers and function of on or off switches).
Change	Living things		All living things (plants and animals) change over time as they grow and mature. Describe, following observation, how plants and animals change over time.	Plants grow from seeds and bulbs. Seeds and bulbs need water and warmth to start growing (germinate). As the plant grows bigger, it develops leaves and flowers. Observe and describe how seeds and bulbs change over time as they grow into mature plants.	Flowers are important in the life cycle of flowering plants. The processes of a plant's life cycle include germination, flower production, pollination, seed formation and seed dispersal. Insects and the wind can transfer pollen from one plant to another (pollination). Animals, wind, water and explosions can disperse seeds away from the parent plant (seed	Habitats change over time, either due to natural or human influences. Natural influences include extreme or unseasonable weather. Human influences include habitat destruction or pollution. These changes can pose a risk to animals and plants that live in the habitat. Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what influences	Humans go through characteristic stages as they develop towards old age. These stages include baby, infant, toddler, child, adolescent, young adult, adult and senior citizen. Puberty is the transition between childhood and adulthood. Describe the changes as humans develop from birth to old age.	Scientists compare fossilised remains from the past to living species that exist today to hypothesise how living things have evolved over time. Humans and apes share a common ancestry and evidence for this comes from fossil discoveries and genetic comparison. Explain that living things have changed over time, using specific examples and evidence.

					dispersal). Draw and label the life cycle of a flowering plant.	these changes.		