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EYFS	Nursery	Reception
	Knowledge: There are different senses. There are different parts to our body There are words that describe materials (e.g. soft, hard, squishy, bouncy). Forces make something move (push, pull). How plants grow and how to look after them. Animals can change throughout their life (lifecycle of a butterfly). Skills: Use all their senses in hands-on exploration of natural materials. Talk about what they see. Talk about the differences between materials and changes they notice. Explore collections of materials with similar and / or different properties. Explore and talk about the different forces they can feel. Plant seeds and care for growing plants. Talk about how to care for living things. Vocabulary: Forces, materials, plants, life cycle, environment, living things, changes. How does this prepare them for the following years? *This prepares them for Reception, where pupils will use their senses to make observations and explore the natural world around them in more detail, thinking about similarities and differences and changing states of matter.*	Knowledge: Know the name of the five senses and how they can use them outside. There are four seasons that change the natural world around them. To know about animals and plants around the world. To know things can change from a liquid to a solid. To know there are eight planets and know the name of the planets. To know what the force of gravity does. Animals live in different habitats. Skills: Explore the natural world and describe it using their senses. Describe the seasons and explain the effect of changing seasons on the natural world around them. Name animals and plants they may see in the world around them. Compare the natural world around them and contrasting environments. To describe that a liquid has changed into a solid. Name the eight planets and describe some similarities and differences between them. To explain what gravity does and compare this to space. Identify and observe simple habitats. To draw pictures of animals and plants, making observations. Vocabulary: Senses, animals, habitats, space, planets, gravity, liquid, solid, plants, environment, similarities, differences, seasons. How does this prepare them for the following years? *This prepares them for KS1, where pupils will build on what they have learnt and begin to make more observations about why things happen.*

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Years	Autumn 1 -Everyday Materials	Autumn 2- Human Senses	Spring 1 / Spring 2- Seasonal Changes	Summer 1- Plant Parts	Summer 2- Animal Parts
1 / 2 Cycle A	Knowledge: Objects are made from materials. Identify a range of everyday materials and their sources. To know what materials are human-made and natural. Skills: Identify and classify materials. Conduct simple experiments to identify properties of materials. Vocabulary: Materials, human-made, natural, identify, classify, experiments *How does this prepare them for the following years?* This prepares them for lower KS2, where they will learn about magnetic forces and make more in-depth observations and draw conclusions, based on the information acquired.	Knowledge: Name the basic parts of the human body. Different animal groups have some common body parts but also some different body parts. Simple equipment is used to take measurements and observations. Data can be recorded and displayed in different ways. Our senses keep us safe from danger. Skills: Draw and label the main parts of the human body and say which body part is associated with which sense. Label and describe the basic structures of a variety of common animals, including fish, amphibians, reptiles, birds and mammals. Perform simple tests and make predictions. Vocabulary: Head, arms, legs, nose, eyes, ears, mouth, hands, feet, hearing, sight, smell, taste, touch, senses, body.	Knowledge: Know the four seasons and weather patterns in each season. The environment is a habitat and can change during seasons. Plants are living things. Know what deciduous and evergreen trees are. All living things change over time as they grow and mature. Know and name different types of weather and understand how the weather can change daily. Weather is a physical process. How day length (the number of daylight hours) changes. Simple equipment can be used for measuring weather. Skills: Observe and describe different types of weather, changes across the four seasons and how living things change over time. Observe the local environment throughout the year and ask and answer questions about living things and seasonal change. Identify, compare, group and sort a variety of common wild and garden plants, including different types of trees. Describe in simple terms how a physical process or human behaviour has affected an area, place or human activity. Use simple equipment to measure and make observations. Ask simple scientific questions.	Knowledge: How plants start and what they need to grow. All living things (plants and animals) change over time as they grow and mature. How seasons have an effect on the plants. Know the names of common plants. Know the name of basic plant parts and trees. Know the name of parts of a leaf. Skills: Identify, compare, group and sort a variety of common wild and garden plants, including different types of trees. Describe, following observation, how plants change over time. Label and describe the basic structure of a variety of common plants. Perform simple tests and begin to predict. Vocabulary:	Knowledge: Animals are living things and can be sorted and grouped into six main groups. Different animal groups have some common body parts. Data can be recorded and displayed in different ways. Know what living things need for survival. Know what carnivores, herbivores and omnivores are and their features. Skills: Identify, compare, group and sort a variety of common animals, based on observable features. Label and describe the basic structures of a variety of common animals. Gather and record data. Describe how to care for plants and animals, including pets. Group and sort a variety of common animals based on the foods they eat.

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		How does this prepare them for the following years? ***This prepares them for lower KS2, where they will learn about the food groups and the importance of a healthy lifestyle for our bodies. They will also begin to look at the skeleton and muscles.***	Vocabulary: Weather, seasons, seasonal changes, evergreen trees, deciduous trees, meteorologist, identify, compare, winter, spring, summer, autumn. *How does this prepare them for the following years?* ***This prepares them for lower KS2, where they will learn about light and shadows.***	Margin, blade, veins and stalk, plant, deciduous trees, evergreen trees, palmate, compound, lobed, needle-like, dormant, bud, blossom, flower, seeds, bulb, sunlight, root, stem, leaf, flower, petal, fruit, trunk. *How does this prepare them for the following years?* ***This prepares them for lower KS2, where pupils will begin to learn in more detail the parts of plants and the functions of these parts, including nutrition and reproduction.***	Ask simple scientific questions. Vocabulary: Carroll diagram, herbivore, carnivore, omnivore, fish, amphibian, reptile, bird, invertebrates, mammals, *How does this prepare them for the following years?* ***This prepares them for lower KS2, where they will learn about animal nutrition in more depth and the importance of this for survival.***

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Years	Autumn 1 -Human Survival	Autumn 2- Habitats	Spring 1- Uses of materials	Spring 2- Plant survival	Summer 1 / 2 - Animal survival
1 / 2 Cycle B	Knowledge: What results are and how to use them. Different stages of a human. Human life cycle starts with an embryo. After birth, comes the juvenile stage before becoming adults and the cycle starts again. A timeline is a linear diagram. A life cycle is a circular diagram. What humans need to survive. What a healthy lifestyle includes and risks associated with an unhealthy lifestyle. What a balanced diet is, the five main food groups and different types of diets (e.g. vegan). The four types of exercise. What a test and prediction are. Germs are microorganisms that can cause illness in humans. Skills: Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language.	Knowledge: Know the name of local habitats and habitats beyond the locality. How habitats provide what a living thing needs to survive. Know what is living, what is dead and what has never been alive. What a microhabitat is. What a food chain is. Plants have adaptations that protect them from being eaten by animals. Skills: Describe a range of local habitats and habitats beyond their locality and what all habitats provide for the things that live there. Compare and group things that are living, dead or have never been alive. Identify and name a variety of plants and animals in a range of habitats and microhabitats. Use a range of methods to gather and record data.	Knowledge: Materials are natural or human-made and are used to make human features. Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay. What a prediction is. The physical properties of a material make them suitable for different purposes. Results can be used to answer a question. Skills: Describe the properties of natural and human-made materials and where they are found in the environment. Sort and group materials based on their features. Identify and classify materials. Describe how some objects and materials can be changed and how these changes can be desirable or undesirable. Begin to notice patterns and relationships in their data and explain what they have done	Knowledge: Living things can be compared and grouped according to their features. What a habitat and microhabitat are. What a bulb is and when these can be planted. How plants start to grow and what they need to stay healthy. Results can be used to answer a question. Skills: Observe living things, sorting and grouping them. Identify and name a variety of plants. Observe and describe how seeds and bulbs change over time. Notice patterns in their data and explain what they have done and found out using simple scientific language. Describe what plants need to grow and stay healthy.	Knowledge: Know the name of local habitats and habitats beyond the locality. How habitats provide what a living thing needs to survive. What a habitat and microhabitat are. What invertebrates are and some examples of these animals. Animals need water, food, air and shelter to survive. What a food chain is and how it always starts with a plant. Data can be recorded and displayed in different ways. Animals have offspring that grow into adults. Different animals have different stages of growth or life cycles. The life cycle stages of a darkling beetle and how mealworms undergo metamorphosis. Skills: Describe a range of local habitats and habitats beyond their locality and what all habitats provide for the things that live there. Identify and name a variety of animals in a range of habitats and microhabitats. Explain what animals, including humans, need to survive. Interpret and construct simple food chains to describe how living things depend on each other as a source of food. Describe the basic life cycles of some familiar animals. Vocabulary: Habitats, microhabitats, beaches, rainforests, deserts, oceans and mountains, egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog, food chain, egg, mealworm (larva),

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	Describe the stages of human development. Describe what humans need to survive. Describe the importance of a healthy lifestyle. Perform simple tests and make predictions. Use simple equipment to measure and make observations. Vocabulary: Healthy, baby, toddler, child, teenager, adult, elderly, test, measure, observe, germs, microorganisms, balanced, embryo, offspring *How does this prepare them for the following years?* *This prepares them for lower KS2, where they will learn about the food groups and the importance of a healthy lifestyle for our bodies. They will also begin to look at the skeleton and muscles.*	Interpret and construct simple food chains. Observe objects, materials, living things and changes over time, sorting and grouping them. Vocabulary: Habitats, microhabitats, food chains, materials, living things, beaches, rainforests, deserts, oceans and mountains, adaptations, plants. *How does this prepare them for the following years?* *This prepares them for lower KS2, where they will learn about how nutrition is also important for animal survival and how their habitat can determine the nutrition they receive. They will also learn about a plant's habitat.*	and found out using simple scientific language. Compare the suitability of a range of everyday materials for particular uses. Vocabulary: Rock, stone, water, sand, soil, water and clay, natural, human-made, wood, metal, plastic, glass, brick, rock, paper, cardboard, materials, squashing, bending, twisting, stretching, heating, cooling, mixing, decay. *How does this prepare them for the following years?* This prepares them for lower KS2, where they will learn about magnetic forces and make more in-depth observations and draw conclusions, based on the information acquired.	Ask and answer scientific questions about the world around them. Vocabulary: Plants, observe, seeds, bulbs, light, microhabitats, germinate, habitat. *How does this prepare them for the following years?* *This prepares them for lower KS2, where pupils will begin to learn in more detail the parts of plants and the functions of these parts, including nutrition and reproduction.*	pupa, adult darkling beetle, worms, molluscs, crustaceans, insects, arachnids, myriapods, Invertebrates. *How does this prepare them for the following years?* *This prepares them for lower KS2, where they will learn about animal nutrition in more depth and the importance of this for survival.*

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Years	Autumn - Animal Nutrition and the Skeletal System	Spring - Forces and Magnets	Summer 1 - Plant Nutrition and Reproduction	Summer 2 - Light and Shadows
3/4 Cycle A	Knowledge: Plants and animals are living things. Plants have different parts to help them survive and reproduce. Plants need sunlight, warmth, nutrients, water, air and space to grow and be healthy. There are six main animal groups. Animals can be carnivores, herbivores or omnivores. All animals need food, water, air, shelter, sleep and space to reproduce and survive. Different body parts have different functions. Animals need to get nutrition from the food they eat. How carnivores, herbivores and omnivores get their nutrition. The purpose of nutrition. The fossils of ancient humans' teeth show that humans have always been omnivores. Humans can suffer from malnutrition which can cause health problems. Know what constitutes a healthy diet (including understanding calories and other nutritional content). The importance of a balanced diet and hydration. In the UK, wild animals' diets change during the year. Learn about the human skeleton and muscles, naming the major bones and muscle groups in the human body. muscle groups in the human body.	Knowledge: 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 (non-contact force). Forces act in pairs that oppose each other. Forces cause objects to move, change speed or change shape. Forces are measured in newtons (N). Mass is measured in kilograms (kg). Learn what the friction force is and the effect this can have on movement. A bar chart displays information (data) as rectangular bars. What observation, results and conclusions are. Magnets have two poles and how these poles attract or repel each other. Know different types of magnets and that they have different strengths. Magnets have invisible magnetic fields that can be seen using iron filings. Magnetic field lines emerge from a magnet's north pole then travel in an arc to a magnet's south pole. Magnetic force is stronger at the poles of a magnet. Iron, cobalt, nickel and steel are magnetic metals. Some materials have magnetic properties. All magnetic materials are metals but not all metals are magnetic. The Earth acts like a huge bar magnet. It is surrounded by an invisible magnetic field called the magnetosphere, protecting it from the Sun's solar wind. A navigational compass needle is magnetic and always points north.	Knowledge: Plant parts have specific functions. They will learn about the roots, stem, leaves and seeds. Know what plants need in order to survive, including air, light, water, minerals and room to grow. Water and nutrients are transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem. Learn about the two main types of root systems, taproot and fibrous root system. Phloem carry food made by the plant's leaves. Know the two main functions of leaves and the purpose of these (photosynthesis and transpiration). The structure, shape, size and position of leaves help them. The processes of a plant's life cycle include germination, flower production, pollination, seed formation and seed dispersal. How seeds can be transferred by insects, wind, animals, water and explosions.	Knowledge: Dark is the absence of light and we need light to see. Light is a form of energy that travels in straight lines. Know what a light source and reflector are and how these can be natural or artificial. Light can be reflected from different surfaces (poor or good reflectors). Properties of reflective and non-reflective material. Know that light from the Sun is damaging for vision and the skin and how to provide protection from the Sun. How a shadow is formed, why a shadow is the same shape as the object that casts it and where shadows appear in correlation to the light source. How opaque, translucent and transparent objects cast different shades of shadows. Skills: Describe the differences between dark and light and how we need light to be able to see.

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	Know some animals have skeletons for support, movement and protection and some have endoskeletons, exoskeleton or no skeleton. Skills: Gather and record findings in a variety of ways, with increasing accuracy. Compare and contrast the diets of different animals. Ask questions about the world around them and explain that they can be answered in different ways. Explain the importance and characteristics of a healthy, balanced diet. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. Describe how humans need the skeleton and muscles for support, protection and movement. Identify and group animals based on their skeleton. Vocabulary: Skull, ribs, spine, humerus, ulna, radius, pelvis, femur, tibia, fibula, bones, muscles, biceps, triceps, abdominals, trapezius, gluteals, hamstrings, quadriceps, deltoids, gastrocnemius, latissimus dorsi, pectorals, exoskeletons, soft tissues, healthy diet, nutritional content, malnutrition, hydrated, proteins, carbohydrates, fruit and vegetables, dairy. *How does this prepare them for the following years?* *This prepares them for upper KS2, where they will learn about human reproduction and ageing.*	Skills: 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 distance (magnetic force). Take measurements in standard units, using a range of simple equipment. Compare how things move on different surfaces. Compare how objects move over surfaces made from different materials. Carry out simple experiments and gather findings. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. Investigate and compare and group a range of magnets (bar, horseshoe and floating), based on their magnetic properties. Explain that magnets have two poles and that poles attract or repel each other. 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. Vocabulary: Frictional forces, force, pull, push, magnetic force, bar, horseshow, floating, magnetic poles, repel, magnetosphere, force metre, newtons. *How does this prepare them for the following years?* *This prepares them for upper KS2, where the children will learn about forces and mechanisms.*	The parts of a flower, the male stamen and the female carpel. What pollination is and after pollination, seeds form in the carpel's ovary. Skills: Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers). Describe the requirements of plants for life and how they vary from plant to plant. Use suitable vocabulary to talk or write about what they have done, the purpose and draw a simple conclusion. Draw and label the life cycle of a flowering plant. Vocabulary: Roots, transport, stem, trunk, leaves, flowers, transported, air, light, water, nutrients, mineral, dispersed, pollination, xylem, lateral roots, fibrous root, aerial roots, vascular plants, vessels, phloem, sepal, petal, stamen carpel, male stamen, anther, filament, female carpel, stigma, style, ovary. *How does this prepare them for the following years?* *This prepares them for upper KS2, where they will learn about human reproduction.*	Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. Group and sort materials as being reflective or non-reflective. Explain why light from the Sun can be dangerous. Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object. Vocabulary: Dark, light, energy, light source, artificial, opaque, translucent, transparent, reflective, non-reflective, shadows, block. *How does this prepare them for the following years?* *This prepares them for upper KS2, where the children will learn about light theory.*

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Years	Autumn 1 -Food and the digestive system	Autumn 2 -Sound	Spring 1 - States of matter	Spring 2- Grouping and Classifying	Summer - Electric circuits and conductors
3/4 Cycle B	Knowledge: Know what an ecosystem is, how they can be damaged and examples of them. Ecosystems have biotic and abiotic features and living things depend on these for survival (interdependence). Know what a producer, a consumer, a predator and prey are and how these are present on the food chain (primary, secondary, tertiary consumer, apex predator). A food chain shows how energy passes from one living thing to another. Changes within a food chain, such as an abundance or lack of one food type, have an impact on the entire food chain. The functions of the digestive system. Know the main parts of the digestive system are the mouth, oesophagus, stomach, small intestines, large intestines and rectum and the purpose of each part. The four different types of teeth and their function. How carnivores, herbivores and omnivores have characteristic types of teeth for different purposes.	Knowledge: Know how an instrument produces sound, how sound can stop, how volume and pitch can be changed. How sound waves travel into your ear (pinna) and interpreted as sound. What sound is and the speed of its travel. Know what a sound source is and how a sound wave is created. There is no sound in space because there is no medium for sound to travel through. Know what volume and pitch are and how these are measured. Understand that loud or continuous noise can damage hearing and how to protect hearing. Sound in the environment can be natural or human-made. We can judge the distance of a sound, based on volume, and also the direction it is coming from. Know what prediction and fair test are.	Knowledge: Materials can be grouped according to their state. Know the properties of solids, liquids and gases. Particles make up all materials. To know how particles are arranged in a solid, liquid and gas. Heating or cooling materials can bring about a reversible or irreversible change of state. The temperature at which materials change state varies depending on the material. To know what melting, freezing, evaporation and condensation are. Know what temperature is, how it is measured and the unit of measure. To know what is meant by melting point, freezing point, boiling point and condensing point and that different materials have different melting and boiling points. A material's state on Earth depends on Earth's temperature. Skills:	Knowledge: Scientists classify living things according to shared characteristics. Animals can be divided into six main groups. These groups can be further subdivided. Classification keys are scientific tools that aid the identification of living things. To know what vertebrates and invertebrates are and their features. To know the six main groups of invertebrates. To know what vascular and non-vascular plants are. There are two main types of vascular plants: plants with seeds and plants with spores. There are two groups of plants with seeds: flowering plants and cone-bearing plants. Skills: Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour.	Knowledge: To know electricity is a type of energy and what it powers. To know electricity comes from two source; batteries and mains, and know the pros and cons of these. Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control. A series circuit has a single path for an electric current to flow through. A series circuit must be a complete loop to work and have a source of power from a battery or cell. A circuit is a collection of components connected by wires through which an electric current can flow. A circuit must be a complete loop to work. 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. When a switch is closed or 'on', the circuit is complete. When a switch is open or 'off', the circuit is incomplete. Plugs and cabling are made from a combination of conductive and insulating materials. Insulating plastic covers conductive metals to make plugs safe to use. A programmable device is a machine that is able to be provided with coded instructions for the automatic performance of a task. Remote control is controlling a machine or activity from a distance. Skills: Compare common household equipment and appliances that are and are not powered by electricity, using a comparison table. Construct operational simple series circuits using a range of components and switches for control.

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	Skills: Gather, record, classify and present observations and measurements in a variety of ways. Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time. Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what influences these changes. Describe the purpose of the digestive system, its main parts and each of their functions. Identify the four different types of teeth in humans and other animals, and describe their functions. Vocabulary: Habitats, carnivores, canines, molars, incisors, premolars, herbivores, omnivores, small intestine, larger intestine, rectum, excretion, mouth, oesophagus, nutrients, digestive system, ecosystems, living organisms. *How does this prepare them for the following years?* *This prepares them for upper KS2, where they will learn about the circulatory system.*	Skills: Explain how sounds are made and heard using diagrams, models, written methods or verbally. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. Compare how the volume of a sound changes at different distances from the source. Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments. Vocabulary: Sound, volume, pitch, vibrations, sound wave, ossicles, cochlea, electrical signals, human-made, natural, decibels. *How does this prepare them for the following years?* *This prepares them for upper KS2, where pupils will learn about other wave forms.*	Group and sort materials into solids, liquids or gases. 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. Observe and explain that some materials change state when they are heated or cooled, measuring the temperature in ˚C at which materials change state, taking accurate measurements. 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. Vocabulary: Celsius, degrees, liquid, solid, gas, change state, melting point, freezing point, boiling point, condensing point, particles. *How does this prepare them for the following years?* *This prepares them for upper KS2 where they will learn about properties and changes of materials.*	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. Vocabulary: Invertebrates, annelids, molluscs, arachnids, crustaceans, insects and myriapods, vascular, seeds, spores, flowering plants, cone-bearing plants, exoskeleton, vertebrates, cold-blooded, warm blooded, mammals, reptiles, amphibians, birds, fish, backbone. *How does this prepare them for the following years?* *This prepares them for upper KS2 where they will learn about human reproduction and ageing and understanding how animals can be grouped together based on their process of reproduction. This learning is also developed in upper KS2, when they learn about evolution and inheritance.*	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. Describe materials as electrical conductors or insulators. 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. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. Investigate and identify the design features of a familiar product. Explain the precautions needed for working safely with electrical circuits. Describe materials as electrical conductors or insulators. Investigate and identify the design features of a familiar product. Write a program to control a physical device, such as a light, speaker or buzzer. Vocabulary: Electrical circuits, programming, conductors, insulators, connections, circuits, electricity, battery, energy, flow, loop, mains. *How does this prepare them for the following years?* *This prepares them for upper KS2 where they will learn about electrical circuits and components.*

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	Autumn - Circulatory System (Animals, Including Humans)	Spring – Electricity (Electrical Circuits and Components)	Summer 1 -Light Theory	Summer 2 -Evolution and Inheritance
Years 5 / 6 Cycle A	Knowledge: To know the role of the circulatory system (including the heart, blood vessels and blood), and how key elements are transported around the body. The human body has different systems that support the seven life processes. To know the function of the skeletal and endocrine systems. To know the function of the heart and blood (including red blood cells and white blood cells), the three types of blood vessels and how these have different-sized holes (lumen) and walls. To know the function of different parts of the heart, including the valves, septum and arteries. Blood is made up of four different components: plasma, platelets, red blood cells and white blood cells. To know what resting heart rate means and how this can be measured. Lifestyle choices can have a positive (exercise and eating healthily) or negative (drugs, smoking and alcohol) impact on the body. To know the four main types of exercise and the impact this can have on the heart. The body needs more oxygen and nutrients during exercise, so the heart beats faster to pump more blood around the body. The Eatwell guide presents the foods and drinks that contribute to a healthy balanced diet. It shows you how much of the five food groups to eat. Skills: Explain that the circulatory system in animals transports oxygen, water and nutrients around the body.	Knowledge: Data can be recorded and displayed in different ways. Electricity is a form of energy that makes things work. To know what a series circuit is and how conductors and insulators cause an effect on them. There are recognised symbols for different components of circuits. To know what a circuit needs to work, and what other components it can include to cause an effect. To know the effect of a switch being open and closed. To know how electric current and the force that pushes electric charge around a circuit (voltage) are measured separately and together. An electric current is the flow of electric charge around a circuit. The bigger the voltage, the more electrons are pushed through the circuit. To know what effect this causes on the components. To know what decomposition is and how this useful for checking programs and debugging because it saves time. To know what a microbit is and how it can be used. Skills: Choose an appropriate scientific approach to recording accurate results, linking to their mathematical skills. Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components.	Knowledge: To know light is a form of energy and how it travels, knowing certain materials absorb and reflect light. The Sun creates day and night and shadows that move and change. Sunlight contains harmful ultraviolet rays. Lasers are intense beams of light and the safety of these. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. To know what the electromagnetic spectrum is and how light is visible. To know how cones in the retina are sensitive to certain colours and how it allows us to see other colours. Mirrors and lenses are used in a range of everyday objects. The human eye has a lens that bends and focuses light on the back of the eye (retina) so that we can see. To know what 'white' light is. To know what refraction is, what this creates and why it is important for humans.	Knowledge: There are five kingdoms: animals, plants, fungi, protists and monerans. Scientists classify living organisms into broad groups according to their characteristics. To know the seven ranks within the biological classification system. To know what fossils are. 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. To know what inheritance (characteristics) and variation (natural differences in characteristics) in species are. To know what adaptation and selective breeding is. is. Skills: Classify living things into groups according to common observable characteristics.

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	Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood. 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. Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment. 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. Explain the impact of positive and negative lifestyle choices on the body. Vocabulary: Oxygen, nutrients, blood vessels, heart, circulatory system, organs, endocrine system, oxygenated, arteries, plasma, platelets, red blood cells, white blood cells, veins, capillaries. *How does this prepare them for the following years?* ***This prepares them for KS3, where pupils will learn the topic of Biology and deepen their understanding of the structure and function of living organisms.***	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. Compare and give reasons for variations in how components in electrical circuits function. 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. Explain how the brightness of a lamp or volume of a buzzer is affected by the number and voltage of cells used in a circuit. Plan and carry out a range of enquiries, including writing methods, identifying and controlling variables, deciding on equipment and data to collect and making predictions based on prior knowledge and understanding. Demonstrate how programs run in an exact order by following a sequence of instructions, and test and debug programs. Use a sensor to monitor an environmental variable, such as temperature, sound or light. Vocabulary: Variables, voltage, circuits, microbit, decomposition, batteries, cells, wires, motors, electricity, electrical insulators. *How does this prepare them for the following years?* ***This prepares them for KS3, where pupils will learn the topic of Physics and deepen their understanding of electricity and electromagnetism.***	Skills: Explain the dangers of lasers and ways to use them safely. Identify that light travels in straight lines. Explain that, due to how light travels, we can see things because they give out or reflect light into the eye. Explain why shadows have the same shape as the objects that cast them and how shadows can be changed. Describe how light behaves when reflected off a mirror (plane, convex or concave) and when passing through a lens (concave or convex). Describe, using scientific language, phenomena associated with refraction of light. Vocabulary: Ultraviolet, light, waves, cones, retina, refraction, lasers, electromagnetic, absorbed. *How does this prepare them for the following years?* ***This prepares them for KS3, where pupils will learn the topic of Physics and deepen their understanding of waves.***	Describe some significant changes that have happened on Earth and the evidence, such as fossils, that support this. Explain that living things have changed over time, using specific examples and evidence. Identify that living things produce offspring of the same kind, but are not identical to either parent. Identify how animals and plants have adapted and this may lead to evolution. Describe what selective breeding is. Vocabulary: Animals, plants, fungi, protists, monerans, evolution, offspring, breeding, genes, adaptations, microorganisms, fossil, reproduce, genetics, kingdom, phylum, class, order, family, genus, species. *How does this prepare them for the following years?* ***This prepares them for KS3, where pupils will learn the topic of Biology and deepen their understanding of genetics and evolution.***

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Years 5 / 6 Cycle B	Autumn 1 Forces and Mechanisms	Autumn 2 Earth and Space	Spring - Human Reproduction and Ageing	Summer - Properties and Changes of Materials
	Knowledge: To know types of mechanisms and how they give us mechanical advantage. Gravity is a non-contact, pulling force which attracts two objects that have mass. 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. A force meter can be used to measure an object's mass in grams (g) or kilograms (kg) and its weight in newtons (N). Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects. To know how these forces are useful and how at times we need to minimise their effects. Different surfaces create different amounts of friction and what affect this causes. To know that air resistance and water resistance are types of friction / contact force and act against the direction of movement. To know the impact of increasing and decreasing these resistances has on objects. To know what a pulley is and what it consists of and how the number of wheels and ropes effect the effort needed to pull objects and the distance the rope has to be pulled. To know that gears are toothed, interlocking wheels that can be place together to make a mechanism that provides a mechanical advantage. To know how gears of the same size and different sizes create different mechanical advantages. Skills: Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects.	Knowledge: The Solar System is made up of the Sun and everything that orbits around it. There are eight planets in our Solar System. 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. The Sun is a huge, hot ball of gas and is the only source of heat and light in the Solar System. The Sun's force of gravity, created by its huge mass, keeps the planets in orbit. To know what planets are made of rock, are hotter and have a shorter orbit and a shorter year. To know what planets are made of gas, are colder and have a larger orbit and a longer year. To know how often the Earth orbits the Sun, how often the Moon orbits the Earth and rotates on its axis, and how often the Earth rotates on its axis (creating day time and night time). To know what phases of the Moon are and to name the eight phases. Waxing means to increase and waning means to decrease. The Earth's axis is tilted at an angle of 23.5° and this changes the length of daytime and night time and creates the different seasons on Earth each year. 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 into the most compact shape – a sphere. To know why countries in the tropics that are on or near the Equator get a similar amount of direct sunlight all year round, the	Knowledge: To know 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. To know the stages of mammals', amphibians', insects and birds' life cycles. A mammal is a vertebrate. To know what a vertebrate is and the five key mammalian characteristics. In general, mammals with a smaller mass have a shorter gestation period, and mammals with a larger mass have a longer gestation period. To know what gestation is, human gestation period is around 40 weeks and what happens during this time. Good personal hygiene can prevent disease or illness. To know what puberty is and that it causes physical and emotional changes. To know what human growth charts are.	Knowledge: Different materials have different properties and makes them suitable for specific purposes / dictating what it can be used for. To know what a method and prediction are. Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Thermal conductors conduct heat. Solid metals are good thermal conductors because their particles are closely packed and they have strong, lattice metallic bonds. Line graphs show a relationship between two variables and usually show changes over time. Solutes will dissolve in solvents to form a solution. The solute can be recovered by evaporating off the solvent by heating. To know what some reversible and irreversible changes are.

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	Explain that objects fall to Earth due to the force of gravity. Take increasingly accurate measurements in standard units, using a range of chosen equipment. Compare and describe, using a range of toys, models and natural objects, the effects of water resistance, air resistance and friction. 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. Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects. Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects. Vocabulary: Levers, gears, pulleys, movement, friction, air resistance, water resistance, force, mechanisms, gravity, gravitational pull. *How does this prepare them for the following years?* ***This prepares them for KS3, where pupils will learn the topic Physics and deepen their understanding of motions and forces.***	weather is warm, the length of daytime and night time are similar, and why there are only two seasons. The Moon appears lit up because it reflects sunlight. A solar eclipse happens when the Moon passes directly between the Earth and the Sun, blocking our view of the Sun and casting a shadow on the Earth. Skills: Describe or model the movement of the planets in our Solar System, including Earth, relative to the Sun. Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses. Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky. Vocabulary: Moon, Earth, Sun, Planets, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, eclipse, phases, new Moon, waxing crescent Moon, first quarter Moon, waxing gibbous Moon, full Moon, waning gibbous Moon, last quarter Moon, waning crescent Moon, equator, orbit, axis, rotate, gravity. *How does this prepare them for the following years?* ***This prepares them for KS3, where pupils will learn the topic Chemistry and deepen their understanding of the Earth and the atmosphere.***	To know humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents. To know what reproduction is, the two types and why it is essential. As humans age, many of the body's systems gradually decline, leading to the changes seen in older people. Skills: Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird. Describe the changes as humans develop from birth to old age. Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding. Explain why personal hygiene is important during puberty. Describe the process of human reproduction. Ask a wide range of relevant scientific questions that	Some mixtures can be separated by filtering, sieving and evaporating. A mixture is a combination of two or more substances that aren't chemically joined and can be separated back into their individual substances. To know what heterogeneous and homogeneous mixtures consist of and the difficulty of separating the mixtures created. Very hot and very cold materials can burn skin. Irreversible changes are usually accompanied by one or more of these signs: a gas is produced; light is produced; a smell is produced or the smell changes; the colour changes; sound is produced, or the temperature changes. Skills: Gather and record data and results of increasing complexity, selecting from a range of methods. Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding.

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			broaden their understanding of the world around them and identify how they can answer them. Vocabulary: Birth, growth, reproduction, death, embryo, juvenile, adolescent, adult, hygiene, reproduction, life cycle, sexual, asexual, mammalian. *How does this prepare them for the following years?* *This prepares them for KS3, where they will learn about the reproductive system.*	Compare and group everyday materials by their properties. 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. Take increasingly accurate measurements in standard units, using a range of chosen equipment. Explain, following observation, that some substances (solutes) will dissolve in liquid (solvents) to form a solution and the solute can be recovered by evaporating off the solvent. Identify, demonstrate and compare reversible and irreversible changes. Separate mixtures by filtering, sieving and evaporating. Explain the precautions needed for working safely when heating, burning, cooling and mixing materials.

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				Vocabulary: Solutes, solvents, heating cooling, mixing, burning, filtering, sieving, evaporating, reversible, irreversible, solubility, transparency, conductivity, electrical, thermal, magnetism, lattice metallic bonds, liquid, gas, solid. *How does this prepare them for the following years?* ***This prepares them for KS3 education, where pupils will learn the topic Chemistry and deepen their understanding of materials and chemical reactions.***