Year 3			
Unit: Rocks and Soils – Autumn 1			
Links to prior Learning	**Knowledge and Skill Objectives**	**Key Vocabulary**	**When/ where is the learning going to next?**
Builds on Everyday Materials in Year 1 where children identify and name common everyday materials, including what a rock Is and start to discuss the features if materials. Builds on Uses of Everyday Materials in Year 2 where children look at the suitability of rock for particular uses.	**(S)** Make systematic and careful observations of rocks. **(K)** Describe and group together different kinds of rocks, on the basis of their appearance and simple physical properties. **(S)** Set up comparative tests e.g. to compare the permeability of different rocks. **(S)** Investigate how things change over time e.g. How fossils are formed **(S)** Use an identification key to find out and name some rocks. **(K)** Explain in simple terms how fossils are formed when things that have lived are trapped within rock. **(K)** Understand how scientific ideas have changed over time by finding out Mary Anning's work helped people understand prehistoric life. **(K)** Recognise that soils are made from rocks and organic matter. **(S)** Set up comparative tests e.g. Investigating the permeability of different soils **Observing overtime – how fossils are formed** **Pattern seeking –** are the more durable rocks also the most impermeable? **Comparative & fair testing –** investigating properties of rocks - permeable/durability Investigating the permeability of different soils **Identifying and classifying –** classify different rocks based on their observations **Researching using secondary resources –** Mary Anning's significance in understanding prehistoric life	Rock, sedimentary, igneous, metamorphic, smooth, rough, light, soil, fossil, grain, crystal, hard, soft, texture, permeable, impermeable, marble, chalk, granite, sandstone, slate, sand, clay, peat, minerals, chemical and physical weathering.	**In Year 4 children will:** Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **In Year 6 children will:** Recognise that living things have changed over time and that fossils provide information about living things

			that inhabited the Earth millions of years ago.
Unit: Light and Shadows – Autumn 2			
Links to prior Learning	**Knowledge Objectives Skills Objectives**	**Key Vocabulary**	**When/ where is the learning going to next?**
Builds on Year 2 where children identify man-made and natural light sources. Experiment with shadows and reflection	**(K)** Recognise that humans need light in order to see things and that dark is the absence of light. **(K)** Know that light is reflected from surfaces. **(K)** Recognise that shadows are formed when the light from a light source is blocked by a solid object. **(K)** Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. **(S)** Explore patterns in the way that the size of shadows change. **(S)** Gather, record, classify and present data in a variety of ways to help in answering questions (e.g. size of shadow in comparison to light source) **(S)** Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. **(S)** Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including using the light sensor on the data loggers to	Light, light source, dark, darkness, reflect, reflective, rays, mirror, shadow, block, direction, opaque, transparent, translucent, sun, torch, lamp, flame, light bulb.	**In Year 6 children will:** Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.

	measure the light emitting from different sources of light or reflected off different surfaces. **(S)** Use results to draw simple conclusions, make predictions, suggest improvements and raise further questions through fair tests (e.g. when designing a fair test: How does the distance between the shadow puppet and the screen affect the size of the shadow?) **(S)** Set up simple practical enquiries/comparative (e.g. Which materials are reflective?) and fair tests (e.g. How does the distance between the shadow puppet and the screen affect the size of the shadow?)		Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.
	Observing overtime – How a shadow changing throughout the day? **Pattern seeking –** Do darker objects make the darkest shadows? **Comparative & fair testing –** which materials are reflective? How does the distance between the shadow puppet and screen effect the size of the shadow? **Identifying and classifying –** classify objects into opaque, translucent and transparent **Researching using secondary resources -**		
Unit: Forces and Magnets – Spring 1			
Links to prior Learning	Knowledge Objectives Skills Objectives	Key Vocabulary	When/ where is the learning going to next?

Builds on Everyday Materials in Year 1 where children learn about the variety and properties of materials. Builds on Uses of Everyday Materials in Year 2 where children learn about the suitability of materials for different uses.	**(K)** Compare how things move on different surfaces. **(S)** Set up simple practical enquiries, comparative and fair tests e.g. exploring which is the strongest magnet or how the mass of an object affects how much force is needed to make it move. **(K)** Notice that some forces need contact between two objects, but magnetic forces can act at a distance. **(S)** Use straightforward scientific evidence to answer questions or to support their findings (e.g. explaining patterns when exploring whether the size and shape of a magnet affects how strong it is.) **(K)** Describe magnets as having two poles. **(K)** Predict whether two magnets will attract or repel each other, depending on which poles are facing. **(K)** Know that magnets attract or repel each other and attract some materials and not others. **(S)** Compare and group/ classify a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials. **(S)** Gather, record, classify and present data in a variety of ways to help in answering questions e.g. following the grouping and classification of which materials in a selection are magnetic. **(K)** Identify uses of magnets. **(S)** Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (e.g. suggesting which magnets would suit which real life purposes – fridge magnet, lifting and extracting metal.) **(S)** Ask relevant questions and using different types of scientific enquiries to answer them. (e.g. exploring which type of magnet may suit a particular purpose the best such as a magnetic 'go fishing' game.)	Force, push, pushing, pull, pulling, contact, non- contact, friction, magnetic, nonmagnetic, magnet, bar magnet, ring magnet, button magnet, horseshoe magnet, strength, poles, North pole, South pole, material, attract, repel, metal, iron, steel.	**In Year 5 children will:** Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity on our lives. Identify the effects of air resistance, water resistance and friction, which act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

	Observing overtime – Magnetised pin – how long does it stay magnetised for/ how does it affect its functioning? **Pattern seeking –** Is the biggest magnet always the strongest? **Comparative & fair testing –** Which surface will create the greatest amount of friction for a toy car? **Identifying and classifying –** Which materials are magnetic? **Researching using secondary resources –** How are magnets used in everyday life?		
Unit: Plants – Spring 2			
Links to prior Learning	Knowledge Objectives Skills Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 1 where children label parts of a flower and talk about their function and identify flowers using identification chart Builds on Year 2 where children learn about what plants need to grow, pollination and seed dispersal. They also look at the life cycle of a plant	**(K)** Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. **(S)** Ask relevant questions and using different types of scientific enquiries to answer them such as comparative tests e.g. Which conditions help seeds germinate faster?; fair tests e.g. How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? **(K)** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. **(K)** Investigate the way in which water is transported within plants (e.g. observing over time: What happens to celery when it is left in a glass of coloured water?) **(K)** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **(S)** Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers to measure	Part, role, leaf, leaves, flower, blossom, petal, fruit, berry, root, bulb, seed, trunk, branch, stem, bark, stalk, water, light, air, nutrients, soil, fertiliser, damp, wet, dry, dark, light, hot, warm, cool, cold, temperature, grow, growth, healthy, transported, life cycle, pollination, seed formation, seed dispersal.	**In Year 6 Children will:** Recognise that living things have changed over time and that fossils provide information about living things Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways, and that adaptation can lead to evolution.

	temperature and amounts of light and how plant growth responds accordingly. **Observing overtime –** What happens to carnation when it is left in a glass of coloured water? What happens to a leaf when submerged in water? **Pattern seeking –** Do all flowers have the same amount of petals? **Comparative & fair testing -** How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? Which conditions help seeds germinate faster? **Identifying and classifying -** How many different ways can you group our seed collection? **Researching using secondary resources -** What are all the different ways that seeds disperse?		

Unit: Animals Including Humans – Summer

Links to prior Learning	Knowledge Objectives Skills Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 1 knowledge where children identify animals and start to classify them by visible features. Children learn omnivores, herbivores and carnivores. Builds on Year 1 human body where children label and parts of the human body and start to describe the main functions	**(K)** Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. **(K)** To identify that a balanced diet is needed in order to stay healthy. **(S)** Ask relevant questions about nutrition and research to answer them e.g. Why do different types of vitamins keep us healthy and which foods can we find them in? **(K)** Identify that humans and some other animals have skeletons and muscles for support, protection and movement. **(S)** Set up simple practical enquiries such as pattern seeking to explore movement **(S)** Gather, record, classify and present data from comparative tests about the human skeleton in a variety of ways to help answer questions (e.g. How does the skull circumference of a girl compare with that of a boy?)	Nutrition, nutrient, food types, fruit and vegetables, dairy food, fat, sugar, carbohydrate, protein, vitamin, mineral, fibre, water, balanced diet, skeleton, muscles, support, protection, movement, skull, ribs, spine, vertebrate, invertebrate, socket, bone, tendon.	**In Year 4 children will:** Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey

Builds on Year 2 where children label main organs in the human body, look at a healthy diet and hygiene	**(S)** Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment (e.g. measuring tapes and rulers to measure limbs or circumference of skull.) **(S)** Use results to draw simple conclusions, make predictions, suggest improvements and raise further questions. **(S)** Use straightforward scientific evidence to answer questions or to support their findings. (e.g. researching why do different types of vitamins keep us healthy and which foods can we find them in?) **(K)** Understand how James Lind explained the cause of scurvy and what his evidence was.		
	Observing overtime – How does our skeleton change over time? (from birth to death) **Pattern seeking –** Do male humans have larger skulls than female humans? **Comparative & fair testing -** Do people with longer legs jump further than those with shorter legs? **Identifying and classifying** – classify different foods into food groups **Researching using secondary resources -** Research why do different types of vitamins keep us healthy and which foods can we find them in?)		

Year 4			
Unit: States of Matter – Autumn 1			
Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
	(K) Compare and group materials together, according to whether they are solids, liquids or gases. (include gases and picture contexts of where they would occur such as air, carbon dioxide, oxygen, natural gas (methane) and water vapor.)	State, matter, solid, liquid, gas, air, oxygen, ice, water, water vapour, steam, heated, heat,	**In Year 5 children will:** Compare and group together everyday materials on the

	(K) Understand that solids, liquids and gases are made up of particles **(K)** Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) (using a temperature sensor.) **(S)** Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (e.g. through observing over time whether there is a pattern in how long it takes different sized ice lollies to melt) **(K)** Understand the process of evaporation. **(K)** Understand the process of condensation. **(K)** Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **(S)** Set up simple practical enquiries **(S)** Record and interpret findings using tables	cooled, cool, temperature, degrees celsius, melt, melting point, freeze, freezing point, solidify, boil, boiling point, evaporate, evaporation, condense, condensation, water cycle, precipitation, infiltration.	basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons based on evidence from comparative and fair tests, for the particular uses of everyday materials, including wood, metals and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and this kind of
	Observing overtime – How does the level of water within a bag change over time? /What happens to melted chocolate overtime when not left on a heat source? **Pattern seeking –** Is there a pattern in how long it takes different sized ice lollies to melt? **Comparative & fair testing -** Investigate whether seawater evaporates quicker than freshwater **Identifying and classifying** – Classifying solids/liquids and gasses. **Researching using secondary resources –** Researching melting points of a range of solid materials		

			change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Unit: Electricity – Autumn 2

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 2 where children identify appliances that use electricity – sort battery and mains. Talk about electrical safety and build a series circuit	**(K)** Identify common appliances that run on electricity. (e.g. through sorting appliances in various ways such as those that run on batteries or mains electricity) **(S)** Record findings using simple scientific language, drawings, labelled diagrams and keys **(K)** Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. (by investigating a range of 'potential circuits' that include various different components.) **(S)** Research and design an electrical safety poster using labelled drawings. **(K)** Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. **(S)** Use results to draw simple conclusions, make predictions, suggest improvements and raise further questions (e.g. making predictions and conclusions after looking for patterns by exploring which room has the most electrical sockets in a house or raising further questions after observing over time how long a battery lights a torch for.) **(K)** Recognise some common conductors and insulators, and associate metals with being good conductors.	Electricity, appliance, device, mains, plug, electrical circuit, complete circuit, circuit diagram, circuit symbol, component, cell, battery, positive, negative, connect, connection, short circuit, wire, crocodile clip, bulb, bright, dim, switch, buzzer, motor, conductor, insulator, metal, non-metal.	**In Year 6 children will:** Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram.

	(S) Use straightforward scientific evidence to answer questions or to support their findings (e.g. when exploring which metal is the best conductor of electricity.) **(K)** Recognise that a switch opens and closes a circuit and associate this with whether a lamp lights in a simple series circuit. **(S)** Ask relevant questions and using different types of scientific enquiries to answer them (e.g researching who actually invented the lightbulb, Thomas Edison or Joseph Swan or a fair test to see how the thickness of a conducting material affects the brightness of a lamp.) **(S)** Identify differences, similarities or changes related to simple scientific ideas and processes. (e.g. by researching how electricity has changed the way we live.)		
	Observing overtime – How long does a battery light a torch for? What happens to the light? **Pattern seeking –** which rooms in the house has the most sockets? **Comparative & fair testing –** conductors and insulators **Identifying and classifying** – Identifying items that use/don't use electricity. How can you group electrical items based on where the electricity comes from? **Researching using secondary resources** – research electrical safety/ who invented the lightbulb/how?		
Unit: Sound – Spring 1			
Links to prior Learning	**Knowledge and Skill Objectives**	**Key Vocabulary**	**When/ where is the learning going to next?**
	(K) Identify how sounds are made, associating some of them with something vibrating. (e.g. through observing rice on drums and vibrations along a string/ cup 'telephone.)	Sound, source, noise, vibrate, vibration, travel, solid, liquid, gas, pitch, high, low, volume, loud, quiet, fainter, insulation,	In KS3 children will learn about: frequencies of sound waves, measured in hertz (Hz);

	(K) Recognise that vibrations from sounds travel through a medium to the ear. (e.g. through exploring the difference between sound travel through air and water using tuning forks.) **(K)** Find patterns between the pitch of a sound and features of the object that produced it. (e.g. through exploring a range of instruments including percussion, stringed instruments, drums and recorders.) **(K)** Find patterns between the volume of a sound and the strength of the vibrations that produced it. (e.g. through exploration of a range of instruments including percussion, drums, recorders and stringed instruments) **(S)** Set up simple practical enquiries, comparative and fair tests **(K)** Recognise that sounds get fainter as the distance from the sound source increases. **(S)** Gather, record, classify and present data in a variety of ways to help in answering questions. (e.g. careful presentation of recorded data using a table following an investigation as to when a classroom is the quietist using the sound meter to measure and seeking patterns to show the link between the measurement of how loud it is in school and the time of day.) **(S)** Identify differences, similarities or changes related to simple scientific ideas and processes (e.g. researching whether all animals have the same hearing range; researching how our understanding and use of ultrasound has changed over time; researching how science has helped people who are deaf since the 1800s.)	instrument, percussion, strings, brass, woodwind, tune.	echoes, reflection and absorption of sound sound needs a medium to travel, the speed of sound in air, in water, in solids sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal auditory range of humans and animals.
	Observing overtime – when is our classroom the quietest? **Pattern seeking –** **Comparative & fair testing –** How does the volume of a drum change as you move further away? How does the length of a guitar string affect the pitch? **Identifying and classifying** – which materials are best for muffling sound? **Researching using secondary resources** – do all animals have the same hearing range?		

Unit: Living things and their Habitat – Spring 2

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 1 knowledge where children identify animals and start to classify them by visible features. Children learn omnivores, herbivores and carnivores. Builds on Animals, including humans in Year 2 where children name and identify plants and animals in their environment.	**(K)** To know what make something living (MRS NERG) **(K)** Recognise that living things can be grouped in a variety of ways. (that there are 5 kingdoms including those of animals and plants; that within animals there are vertebrates and invertebrates) **(K)** Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. **(S)** Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (e.g. Create classification keys liquorice all sorts.) **(S)** Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions **(K)** Describe how changes in the local environment can be dangerous to living things **Observing overtime –** **Pattern seeking –** **Comparative & fair testing –** **Identifying and classifying** – Can we use the classification keys to identify leaves found on school grounds. **Researching using secondary resources** – Why are people cutting down the rainforests and what effect does that have?	Classification, key, habitat, environment, human impact, fish, amphibian, reptile, bird, mammal, vertebrate, invertebrate, shelter, food, protection.	**In Year 5 (Animals, Including Humans):** Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. **In Year 6 (Living things & their Habitats):** Classify living things into broad groups according to observable characteristics and based on similarities and differences. Give reasons for classifying plants and animals based on specific characteristics.

Unit: Animals Including Humans - Summer 1

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 1 knowledge where children learn omnivores, herbivores and carnivores. Builds on Year 2 where children label main organs in the human body, look at a healthy diet and hygiene	**(K)** Describe the simple functions of the basic parts of the digestive system in humans. **(S)** Ask relevant questions and use different types of scientific enquiries to answer them (e.g. looking for patterns in food packages to see whether foods that are high in energy are always high in sugar.) **(K)** Identify the different types of teeth in humans and their simple functions. **(K)** Identify and classify carnivores, herbivores and omnivores. **(S)** Set up simple practical enquiries (e.g. observing over time how an eggshell changes when it is left in cola.) **(K)** To explore ways of keeping teeth healthy. **(K)** Construct and interpret food chains **(K)** Explore/ understand food webs **(S)** Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. (e.g. researching visually and explaining how we can organise teeth into groups or exploring how a visit to the dentist has changed since ancient times; researching how dentists fix broken teeth.) **Observing overtime –** egg shell left in different liquids **Pattern seeking –** Are foods that are high in energy always high in sugar? **Comparative & fair testing –** are omnivores taller than herbivores? **Identifying and classifying** – organising teeth into groups **Researching using secondary resources** – wisdom teeth – why do some people get them and others don't?	Digestive system, nutrition, nutrients, mouth, teeth, canine, incisor, molar, pre-molar, saliva, tongue, rip, tear, chew, grind, cut, oesophagus, stomach, small intestine, large intestine, rectum, anus, carnivore, herbivore, omnivore, producer, consumer, predator, prey, food chain	**In Year 5 children will:** Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird. Know the differences between different life cycles. Know the process of reproduction in plants. Know the process of reproduction in animals

Year 5			
Unit: Forces– Autumn 1			
Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 3 where children learn about attract and repel with magnets	**(K)** Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. **(K)** Identify the effects of friction between moving surfaces. **(K)** To identify and explain the effects of air resistance. **(S)** Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations **(S)** Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. (e.g. when testing how the surface area of a parachute affects the time it takes to fall to the ground use precision measurements in surface area and time and make repeated attempts; how the angle of launch affect how far a paper rocket will go, use measuring tapes, rulers and angle measurers accurately.) **(K)** To identify and explain the effects of water resistance. **(S)** Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. (e.g. when exploring how the surface area of a container affects the time it takes to sink, list all the constant variables and identify which variable is changing in the fair test.) **(S)** Use test results to make predictions to set up further comparative and fair tests (e.g. develop students' own investigations following a pattern seeking investigation to explore whether all objects fall through water in the same way.) **K)** Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	Earth, gravity, mass, weight, force, Newton, air resistance, water resistance, upthrust, friction, moving surface, mechanism, lever, pulley, gear, force meter	**KS3:** Explore push and pull interaction between two objects Draw arrows in diagrams to show balanced and unbalanced Know that moment as the turning effect of a force Explore forces associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water Measure forces Work done and energy changes on deformation Non-contact forces: gravity forces acting at a distance on Earth and in space, forces

	(S) Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs **Observing overtime –** How long does a pendulum swing for before it stops/what happens to it? **Pattern seeking –** How does surface area of parachute affect the time it takes to fall? **Comparative & fair testing –** How does the surface area of an object affect the time it takes to sink? **Identifying and classifying** – identify and label the forces acting upon an object **Researching using secondary resources** – How do submarines sink if they are full of air?		between magnets, and forces due to static electricity

Unit: Properties of Materials – Autumn 2

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 1 knowledge where children categorise different objects and start to look at properties Builds on Year 2 where children sort materials and look at links between properties of shape and their job	**(K)** Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. **(K)** Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (e.g. looking at strength in food packaging; best materials for drink containers to make liquid hot or cold; best materials for cleaning cloths; best materials for surfaces) **(K)** To know and identify thermal conductors and insulators **(S)** To make evidence-based predictions (e.g. which material will prevent the ice cube from melting the longest?) **(K)** Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.	Hard, soft, elastic, rigid, flexible, waterproof, absorbent, strong, weak, rough, smooth, transparent, opaque, translucent, reflective, non reflective, magnetic, attract, solubility, electrical conductivity, thermal	**KS3:** The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure changes of state in terms of the particle model

Builds on Year 3 where children explore magnesium and group items according to their features Builds on Year 4 where children explore solids, liquids and gasses	**(K)** Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, magnetising and evaporating. **(S)** Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. (e.g. while investigating how a sugar cube changes as it is put into a glass of water; how a nail in saltwater changes over time.) **(K)** Demonstrate that dissolving, mixing and changes of state can be reversible changes. **(K)** Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible – irreversible changes - including changes associated with burning and the action of acid on bicarbonate of soda. **(S)** Discuss how test results could be used to set up further investigations **(S)** Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. (e.g. after observing how a container of salt water changes over time.)	conductivity, change state, melting, solid, liquid, gas, dissolve, solution, soluble insoluble, solute, solvent, particle, mix, mixture, filtering, sieving, evaporating, residue, burn, reversible, irreversible	
	Observing overtime - Which material is best for keeping our hot chocolate warm? **Pattern seeking –** Is there a pattern in how long it takes different sized ice lollies to melt? **Comparative & fair testing –** **Identifying and classifying** – Can you group these materials based on whether they are transparent or not? **Researching using secondary resources** – What are microplastics and why are they harming the planet?		

Unit: Earth and Space – Spring 1

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 1 seasons where children look at features of seasons and daylight in these months Builds on Year 3 where children learn that light from a light source can be blocked by a solid object	**K)** Describe the Sun, Earth and Moon as approximately spherical bodies. **(K)** Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. (e.g. modelling with different sized fruit/polystyrene balls to demonstrate.) **(K)** Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. (make sundials; investigate how shadows move and explore world time zones.) **(S)** Record data and results of increasing complexity using pie charts. (e.g. to show how 24 hours is divided up into daylight and night time.) **(K)** To learn how the Earth's tilt creates seasons and affects hours of daylight. **(S)** Record data and results of increasing complexity using line graphs. (e.g. to show average temperature on planet for each month of the year; show daylight hours.) **(K)** Describe the movement of the Moon relative to the Earth. (observe and identify all the phases in the cycle of the Moon.) **(K)** To discover how theories of our solar system have changed. **(S)** Identify scientific evidence that has been used to support or refute ideas or arguments. (e.g. when exploring how ideas about the solar system have changed over time; how astronomer and planetary scientist Sarah Seagar is changing our ideas about the universe.) **(K)** To investigate the planets in the solar system. **(S)** Plan different types of scientific enquiries to answer questions. (e.g. explore pattern between the size of a planet and the time it takes to travel around the Sun; compare how the length of daylight hours changes in each season) **(S)** Record data and results of increasing complexity using tables. (e.g. comparative table of different planets and their diameter, distance from the sun, average temperature, rotation, atmosphere, type of planet.)	Earth, planet, sun, solar system, moon, celestial body, sphere, spherical, rotate, rotation, night and day, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, 'dwarf' planet, orbit, revolve	

	(S) Record data and results of increasing complexity using bar graphs. (e.g. to compare the diameter of different planets.)		
	Observing overtime - Can you observe and identify all the phases in the cycle of the Moon? **Pattern seeking –** Is there a pattern between the size of a planet and the time it takes to travel around the Sun? **Comparative & fair testing –** How does the length of daylight hours change in each season? **Identifying and classifying** – How could you organise all the objects in the solar system into groups? **Researching using secondary resources** – How have our ideas about the solar system changed over time?		

Unit: Living things and their habitat – Spring 2

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 1 knowledge where children identify animals and start to classify them by visible features. Children learn omnivores, herbivores and carnivores. Builds on Year 1 where children label parts of a flower and talk about	**(K)** Know and describe the 7 living processes **(K)** Describe the process of sexual reproduction in flowering plants. **(K)** Describe the process of asexual reproduction in plants. **(K)** Describe the differences in the life cycles and sexual reproduction of a mammal, an amphibian, an insect and a bird. **(S)** Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (e.g. comparing a collection of animals based on the similarities and differences in their lifecycle and explaining the differences between the lifecycle of an insect and a mammal.) **(S)** Use test results to make predictions to set up further comparative and fair tests (after observing over time how brine shrimp change over	Life cycle, reproduction, sexual, asexual, germination, pollination, seed, seed dispersal, pollen, stamen, stigma, mammal, amphibian, insect, bird, fish, reptile, eggs, live young.	**Year 6:** Chn will look at classification Use classification keys Classify plants and animals Learn about microorganisms **KS3:** reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without

their function and identify flowers using identification chart Builds on Year 2 where children learn about what plants need to grow, pollination and seed dispersal. They also look at the life cycle of a plant Builds on Year 3 Plants topic where children identify different part of plants and look at pollination and germination. Builds on Year 4 knowledge where children learn about MRG NERG and the 5 animal kingdoms.	their lifetime, suggest some linked comparative or fair tests and make predictions about other animal species life cycles.) **(S)** Can suggest methods of recording results and with support can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs. **Observing overtime -** How does a bean change as it germinates? **Pattern seeking –** **Comparative & fair testing –** **Identifying and classifying** – classify animals into the 5 animal kingdoms **Researching using secondary resources** – research the life cycle of a chosen animal and present their finding		details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta
Unit: Animals Including Humans			
Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?

Builds on Year 2 where children label main organs in the human body, look at a healthy diet and hygiene Builds on Year 3 where children look at skeletons, nutrition, name different bones Builds on Year 4 where chn look at the digestive system, teeth/ how to care for them/ food chains/webs	**(K)** Identify and describe the changes as humans develop to old age in the human life cycle. **(K)** To know the stages in gestation period of humans and compare them to other animals. **(K)** To compare how different animals reproduce and grow by focussing on gestations periods and growth. **(K)** To recognize the stages of development during childhood and understand the needs of children at those stages. **(S)** Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. (e.g. in a fair test to explain how age affects a human's reaction time; when seeking to find a pattern between height and age in our school when asking whether the oldest children are always the tallest.) **(S)** Record data using scatter graphs (e.g. exploring the relationship between height and age.) **(S)** Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. (e.g. researching how and why life expectancy has changed in the UK since the Middle Ages; after a comparative test to investigate who grows the fastest, girls or boys?) **(K)** To understand the initial changes inside and outside the body during puberty (links with RSE). **(K)** To know the changes that occur during puberty and how they are differ for boys and girls. **(K)** To understand how the body changes during adulthood and old ages, including challenging stereotypical views regarding elderly.	Growth, development, stages, embryo, foetus, uterus, womb, vagina, ovaries, gestation period, life cycle, baby, child, adolescent, adult, senior, elderly, puberty, penis, menstruation, periods, hormones, testicles, pubic hair	**Year 6:** Explain the function of the heart Know the function of the blood and what it is made up of Describe how nutrients and water are absorbed in the body Recognise the impact of drugs on the body

	Observing overtime observing over time how brine shrimp change over their lifetime - **Pattern seeking –** Is there a relationship between a mammal's size and its gestation period? **Comparative & fair testing –** who grows the fastest, boys or girls? **Identifying and classifying** – Can you identify all the stages in the human life cycle? **Researching using secondary resources** – research how and why life expectancy has changed in the UK since the Middle Ages		

Year 6			
Unit: Evolution and inheritance – Autumn 1			
Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Rocks and soil in Year 3 where children learn how fossils are formed when things that have lived are trapped within rocks. Builds on lifecycles in Year 5 where children learn about the life process of reproduction in some plants.	**(K)** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. **(K)** Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. **(S)** Identifying scientific evidence that has been used to support or refute ideas or arguments. (e.g. research geneticist Barbara McClinock's ideas about genes that won her a Nobel prize.) **(K)** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **(K)** Recognise that fossils provide information about living things millions of years ago **(K)** Understand how fossils are formed	Evolution, suited, fossils, environment, adapted, adaptation, offspring, characteristic, vary, variation, inherit, inheritance.	

Builds on animals and changes in habitats in Year 4 where children learn about how environments can change and pose dangers to animals and plants.	**(S)** Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. (e.g. research what happened when Charles Darwin visited the Galapagos Islands; whether there is a pattern between the size and shape of a bird's beak and the food it will eat; compare the skeletons of apes, humans and Neanderthals and explain how they are similar and different; comparative test to investigate which is the most common eye colour in the class.)		
	Observing overtime - How has the skeleton of the horse changed over time? **Pattern seeking -** Is there a pattern between the size and shape of a bird's beak and the food it will eat? **Comparative & fair testing –** What is the most common eye colour in our class? **Identifying and classifying** – Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? **Researching using secondary resources** – What happened when Charles Darwin visited the Galapagos islands?		

Unit: living things and their habitat – Autumn 2

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on classification in Year 4 where keys are used to group, identify and name a variety of living things.	**(K)** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (e.g. explore how you would make a classification key for vertebrates/ invertebrates or microorganisms.) **(S)** Identify scientific evidence that has been used to support or refute ideas or arguments. (e.g. Exploring how Charles Linnaeus' ideas helped us to group plants)	Organism, microorganism, fungus, bacteria, virus, fish, amphibian, reptile, bird, mammal, vertebrate, invertebrate, arachnid, mollusc, insect, crustacean, classification	**KS3:** reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones),

	(K) Give reasons for classifying plants and animals based on specific characteristics. (e.g. explain how different animal embryos change.) **(S)** Classify plants according to characteristics. **(S)** Be able to identify and classify organisms in the local area. **(S)** Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. (e.g. when conducting a fair test to explore how temperature affects how much gas is produced by yeast.) **(S)** Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. **(K)** to learn about different types of microorganisms **(S)** Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. **(S)** Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. **(S)** Use test results to make predictions to set up further comparative and fair tests. (e.g. after observing over time what happens to a piece of bread when you leave it on the windowsill for two weeks.)	key, environment.	gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta
	Observing overtime - What happens to a piece of bread if you leave it on the windowsill for two weeks? **Pattern seeking -** **Comparative & fair testing –** How does the temperature affect how much gas is produced by yeast? **Identifying and classifying** – How would you make a classification key for vertebrates/invertebrates or microorganisms? **Researching using secondary resources** – Exploring how Charles Linnaeus' ideas helped us to group plants		

Unit: Light – Autumn 2

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
Builds on Year 2 where children identify man-made and natural light sources. Experiment with shadows and reflection Builds on Light and shadow in Year 3 where children learn that shadows are formed when light from a light source is blocked by a solid.	**(K)** Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. **(K)** Recognise that light appears to travel in straight lines. (e.g. make a periscope) **(K)** Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. **(K)** Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. (identify objects that cast particular shadows from their shadows only.) **(K)** To learn about the law of reflection and use knowledge of angles to predict reflected light rays. **(K)** To explain how refraction can bend and change the direction of light rays. **(S)** Report and present findings from enquiries **(K)** To investigate colours in white light, linking it to Isaac Newton's experiments with prisms. **(K)** Explain how we see colour **(S)** Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (e.g. graphs and diagrams that show how my shadow changes over the day; line graphs that show a relationship between the size of the shadow and the distance from a light source.) **(S)** Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (e.g. a fair test that investigates how the angle that a light ray hits a plane mirror affects the angle at which it reflects off the surface) **Observing overtime -** How does my shadow change over the day? **Pattern seeking -**	Light, light source, dark, darkness, reflect, reflective, mirror, shadow, block, absorb, direct, direction, transparent, opaque, translucent.	**KS3:** the similarities and differences between light waves and waves in matter light waves travelling through a vacuum; speed of light the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye light transferring energy from source to absorber, leading to chemical and electrical effects; photosensitive

	Comparative & fair testing – How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? **Identifying and classifying** – **Researching using secondary resources** – Why do some people need to wear glasses to see clearly?		material in the retina and in cameras colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection

Unit: Living things and their habitat – Spring 2

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?
In Year 4, children should: Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this	**(K)** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (e.g. explore how you would make a classification key for vertebrates/ invertebrates or microorganisms.) **(S)** Identify scientific evidence that has been used to support or refute ideas or arguments. (e.g. researching what different types of micro-organisms do and whether they are always harmful; exploring how Charles Linnaeus' ideas helped us to group plants; investigating the ideas that Edward Jenner had about smallpox and how he tested them.) **(K)** Give reasons for classifying plants and animals based on specific characteristics. (e.g. explain how different animal embryos change.) **(S)** Classify plants according to characteristics. **(S)** Be able to identify and classify organisms in the local area. **(S)** Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when	Organism, microorganism, fungus, bacteria, virus, fish, amphibian, reptile, bird, mammal, vertebrate, invertebrate, arachnid, mollusc, insect, crustacean, classification key, environment.	In Key Stage 3 children will learn about: the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere the adaptations of leaves for photosynthesis.

can sometimes pose danger to living things. In Year 5, children should: describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals	appropriate. (e.g. when conducting a fair test to explore how temperature affects how much gas is produced by yeast.) **(S)** Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. (e.g a pie chart or bar chart after conducting a comparative test to find out which is the most common invertebrate on the school field.) **(S)** Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. **(S)** Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. (e.g. pattern seeking when asking do all flowers have the same number of petals?) **(S)** Use test results to make predictions to set up further comparative and fair tests. (e.g. after observing over time what happens to a piece of bread when you leave it on the windowsill for two weeks.)		the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops the importance of plant reproduction through insect pollination in human food security how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.
	Observing overtime - observing over time what happens to a piece of bread when you leave it on the windowsill for two weeks **Pattern seeking –** do small seed grow small plants? **Comparative & fair testing –** explore how temperature affects how much gas is produced by yeast **Identifying and classifying** – How would you make a classification key for vertebrates/invertebrates or microorganisms? **Researching using secondary resources** – researching what different types of micro- organisms do and whether they are always harmful		

Unit: Animals including humans – Spring 1

Links to prior Learning	Knowledge and Skill Objectives	Key Vocabulary	When/ where is the learning going to next?

Builds on Year 2 where children label main organs in the human body, look at a healthy diet and hygiene Builds on Year 3 where children look at skeletons, nutrition, name different bones Builds on Year 4 where chn look at the digestive system, teeth/ how to care for them/ food chains/webs Builds on Year 5 where chn look at the different stages of human development, gestation periods, life expectancy	**(K)** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. **(S)** Record identification of organs that make up the circulatory (circulation) system and when they can be found. **(K)** Describe the ways in which nutrients and water are transported within animals, including humans. **(K)** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. **(S)** Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. (e.g. after observing over time how much exercise a person does over the course of a week; researching how our ideas about disease and medicine have changed over time.) **(S)** Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. (a comparative test to see what type of exercise has the greatest effect on our heart rate.) **(S)** Take measurements, using a range of scientific equipment, including blood pressure monitors, with increasing accuracy and precision, taking repeat readings when appropriate. (e.g. when observing over time how heart rate changes over the course of a day; a fair test to see whether exercising regularly can affect a person's lung capacity.)	Circulatory system, heart, blood, blood vessel, artery, capillary, vein, pump, oxygen, carbon dioxide, lungs, nutrients, water, diet, exercise, drugs, lifestyle	In Key Stage 3 children will learn about: the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) calculations of energy requirements in a healthy daily diet the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases the structure and functions of the gas exchange system in humans, including adaptations to function the effects of recreational drugs (including substance

			misuse) on behaviour, health and life processes.