Science Skills Progression

Area	Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically ***Progression across working scientifically statements comes are children revisit skills across different units of work. Within a key phase, children will apply skills with increasing independence, across different contexts and enquiry types.**							
Working Scientifically skills progression	explore the world around them foster curiosity and encourage children to ask questions about the world around them encourage focussed observation and make observational drawings of natural surroundings including animals and plants observe and interact with natural processes e.g. ice melting, shadows, materials, magnets, vibrations caused by sound model and listen to children describing what they have seen to develop vocabulary demonstrate familiarity with scientific concepts such as experimenting e.g. floating and sinking	ask simple questions and recognise that they can be answered in different ways (fair tests, comparative tests, observation over time, research, pattern seeking) ask questions of members of staff or visitors observe closely, using simple equipment (hand lenses, egg timers) perform simple tests to investigate the answer to a given question perform simple identifying and classifying, grouping using basic observations use my observations and ideas to suggest answers to questions, using simple sentences to describe the answer gather and record data to help in answering questions, using given tables or data formats	ask simple questions and recognise that they can be answered in different ways (fair tests, comparative tests, observation over time, research, pattern seeking) ask questions of members of staff or visitors research the answers to questions using books, tablets or computers observe closely, using simple equipment (hand lenses, egg timers, rulers, stopwatches) perform simple tests to investigate the answer to a given question begin to design my own tests to investigate the answer to a given question perform simple identifying and classifying, grouping using basic observations begin to group using prior knowledge use my observations and ideas to suggest answers to questions, using simple sentences to describe the answer give basic conclusions with simple reasoning gather and record data to help in answering questions, using given tables or data formats drawing own tables, deciding how to record	ask relevant questions and use different types of scientific enquiries to answer them (fair tests, comparative tests, observation over time, research, pattern seeking) begin to select my own methods to find the answer to a scientific question set up simple practical enquiries, comparative and fair tests begin to design my own tests and manage variables make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers, rulers, stopwatches, measuring cylinders and jugs. gather record, classify and present data in a variety of ways to help in answering questions begin to use simple keys for classification record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	ask relevant questions and use different types of scientific enquiries to answer them (fair tests, comparative tests, observation over time, research, pattern seeking) select my own methods to find the answer to a scientific question begin to combine research with my own investigations to confirm conclusions. set up simple practical enquiries, comparative and fair tests design my own tests & identify and manage variables. make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers, rulers, stopwatches, measuring cylinders/jugs and data loggers. begin to make decisions about what equipment is appropriate for investigations gather, record, classify and present data in a variety of ways to help in answering questions identify criteria for classification and use and create simple keys	plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (fair tests, comparative tests, observation over time, research, pattern seeking) select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate make my own decisions about what observations to make, repeat readings & learn about reliability record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (in line with Year 5 maths curriculum learning) use test results to make predictions to set up further comparative and fair tests make predictions and complete further investigation report and presenting findings from enquiries, including conclusions, causal	plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (fair tests, comparative tests, observation over time, research, pattern seeking) select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. plan and execute appropriate investigations based on a given or student-led question take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate make my own decisions about what observations to make, repeat readings & learn about reliability, developing an increased level of precision and accuracy record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (in line with Year 6 maths curriculum learning) use test results to make predictions to set up further comparative and fair tests

				explain findings from investigations to rest of class use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions draw clear conclusions from findings & make predictions based on this, suggest improvements to the investigation identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support my findings	record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions explain findings from investigations to rest of class be able to comment on the findings of other investigations compared to my own and how they support or contradict. use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions draw conclusions and support with clear evidence, suggest improvements, raise further questions and possible next investigations identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support my findings	relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations, including giving an explanation of trust in results, with reasons identify scientific evidence that has been used to support or refute ideas or arguments, including identifying which evidence they have produced supports or refutes ideas or arguments	make predictions and complete further investigation – combine with research report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations, including giving an explanation of trust in results, with reasons identify causal relationships in investigations identify scientific evidence that has been used to support or refute ideas or arguments, including identifying which evidence they have produced supports or refutes ideas or arguments begin to research evidence to support or refute ideas/arguments & begin to separate opinion from fact
Substantive knowledge							
Animals including humans	**Understanding the world** **Understand some sense of themselves and their place in the world around them.** Pupils will know: • *We are human* • *Some of us are boys and some are girls.* • *Name some parts of the body (head, eyes, nose, mouth, ears, neck, shoulder, arms, hands, fingers, chest, tummy/belly, bottom, legs, knees, feet, toes)* • *Know we need food, drink and sleep.* *Common Misconceptions to address:*	**Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.** Pupils will know: • Names of common animal groups (*fish, amphibians, reptiles, birds, insects, arachnids and mammals)* • There are many different kinds of animals with different characteristics, • Names of individual common animals, native and otherwise (eg Native - dog, cat, horse, cow, chicken, frog, fly, goldfish, spider. Non-	**Know that animals, including humans, have offspring which grow into adults.** Pupils will know: • animals reproduce • Live birth (mammals) • Many animals lay eggs (birds, fish, reptiles, amphibians, insects, arachnids) • Names of common young (baby, child, lamb, piglet, puppy, kitten, foal, calf, chick, larvae) *Common Misconceptions to address:* • *Humans aren't animals* • *mammals don't have eggs*	**Know 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.** Pupils will know: • *Animals, including humans, get nutrition from what we eat.* • *Animals cannot make their own food.* • *We need the right type of nutrition (carnivores, herbivores, omnivores)* • *Omnivores (eg humans) need a balanced diet.* *Common Misconceptions to address:*	**Describe the imple functions of the basic parts of the digestive system in humans.** Pupils will know: • Parts of the digestive system – mouth, tongue, teeth, oesophagus, liver, stomach, pancreas, small intestine, large intestine, rectum, anus • Basic understanding of the job of each part. • mouth – teeth break down food and mix with enzymes in saliva.The tongue rolls the food into a soft ball and passes it to the back of the mouth.	**Describe the changes as humans develop to old age.** Pupils will know: • Baby – toddler – child – teenager – adult – old age • Babies feed only on milk and then smooth food. Toddlers begin to eat solid food. • Children go through puberty as they move into teenage years. • Puberty involves changes such as - Girls: menstruation, breast growth, pubic hair, spots; Boys: pubic hair (& chest), genital growth, voice deepens, sweat more,	**Identify and name the parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood** Pupils will know: • heart is a pump. It is made up of 4 chambers (ventricles and atria) • Arteries carry oxygenated blood from the heart to the muscles and organs. • Veins carry deoxygenated blood back from the muscles and organs to the heart. • Capillaries are tiny vessels which cover a large area of muscles and organs to

	• Our "body" is just our torso. • mixing up elbows/shouders/knees vocab: human, boy, girl, *head, eyes, nose, mouth, ears, neck, shoulder, arms, hands, fingers, chest, tummy/belly, bottom, legs, knees, feet, toes*	native – monkey, snake, elephant, lion, bear) • Humans are animals – mammals *Common Misconceptions to address:* - *humans are not animals* - *spiders are insects* *vocab: humans fish, amphibians, reptiles, birds, insects, arachnids and mammals, pets, native, non-native,* **Identify and name a variety of common animals that are carnivores, herbivores and omnivores** I know: • Can explain the meaning of carnivore, herbivore and omnivore. • Names examples of carnivores • Names examples of herbivores • Names examples of omnivores *Common Misconceptions to address:* • *Whales/dolphins are fish (They are mammals)* • *Anything with sharp teeth must be a carnivore.* • *Vegetarians or vegans are herbivores (this is a choice, not a biological truth)* • *vocab: herbivore, carnivore, omnivore, examples of each* **Identify the structure of a variety of common animals.** : I know: • Most common animals have a skeleton. • Insects have a head, thorax abdomen *Common Misconceptions to address:* • *all animals have a skeleton (jellyfish) humans/monkeys have 2 limbs – discuss difference between legs and limbs*	*vocab: offspring, young, adult, names of young (baby, child, lamb, piglet, puppy, kitten, foal, calf, chick, snakelet, spiderling, larvae)* **Know the basic needs of animals, including humans, for survival (water, food and air)** I know: • Animals need oxygen to survive. • Animals need water and food to survive. *Common Misconceptions to address:* • *Fish don't need air – they take it in through their gills.* • *Aquatic mammals (dolphins, whales) must come to the surface to breathe – hence the blowholes.* • *Fish etc don't drink water because they live in it.* *vocab: survival, water, drink, nutrition, food, eat, air, breathe, needs, aquatic* **Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.** I know: • exercise is important to be healthy • a balanced diet is important to be healthy • sleep is important to be healthy • good hygiene (washing hands before food/drink, brushing teeth, cleaning self regularly, avoiding spread of germs) is important to be healthy *Common Misconceptions to address:* • *Unhealthy means "fat" – slim people can be unhealthy too.* • *Exercise on its own will keep you slim.* • *Eating only fruit and veg is a healthy diet.* • *You can eat lots of unhealthy food as long as you have some veg as well.*	• *Humans "make" their own food – this means create food within the body, not the way we make a sandwich etc.* *Vocab: food, nutrition, eat, carnivore, herbivore, omnivore, balanced diet, carbohydrate, protein, fats, sugar, minerals, water, fibre, vitamins,* **Identify that humans and some other animals have skeletons and muscles for support, protection and movement.** I know: • Humans and some other animals have skeletons. • Difference between vertebrates and invertebrates. • Skeletons and muscles support the body – keep it in shape. • Skeletons and muscles protect the organs – know which, eg ribs protect heart and lungs. • Skeletons and muscles are used in movement – note: learn about how muscles pull the bones and work in pairs. *Common Misconceptions to address:* • *All animals have skeletons.* • *May be some misconceptions about where organs are in the body or what constitutes an organ e.g. the skin is an organ* *Vocab: skeleton, vertebrate, invertebrate, spine, support, shape, protect, internal, organs, stomach, heart, lungs, brain, ribs, pelvis, skull, muscle, movement, pull, ligament, tendon, contract, relax*	• oesophagus – thin tube connecting mouth to stomach. • liver – releases a substance called bile into intestines. • stomach – muscular bag mixes food and drink with acid to break it down. • pancreas – releases enzymes into the intestines, which break down carbohydrate, proteins and fats. • small intestine – proteins, carbohydrate, and fats digest. Nutrients absorbed into the blood. • Large intestine – food which can't be broken down (mainly fibre) passes into here. Water absorbed into the blood. • Rectum – undigested food is stored here as faeces. • anus – opening where faeces leave the body. *Common Misconceptions to address:* • *no food is digested in the mouth.* *vocab: digestive system, oesophagus, stomach, liver,bile small intestine, lipids, carbohydrates, nutrients, proteins, large intestine, rectum, anus, faeces, fibre, mouth, tonguem teeth* **Identify the different types of teeth in humans and their simple functions.** I know: • There are different types of teeth in the mouth with different jobs. • Teeth have an enamel coat which is hard and strong. • Incisors – bite off and chew food. • Canines – for ripping and tearing food • Molars – for crushing and grinding food.	begin to produce sperm, spots. • Puberty also means both sexes produce lots of hormones which can affect mood and behaviour. • As we reach old age, our bodies don't work as well. We become more vulnerable to disease and injury. • Different animals mature at different rates and live to different ages. *Common Misconceptions to address:* • *All people reach old age.* • *Teenagers are moody for no reason.* • *We get bigger as we get older (note – stay at full adult height until old age shrinkage).* *Vocab: baby, toddler, child, teenager, adult, elderly, puberty, hormones, menstruation, breast, genital, pubic hair, sperm, womb, embryo, gestation, foetus,*	allow oxygen to easily diffuse from the blood to where it is needed. • Blood contains red blood cells, white blood cells, plasma and platelets. • Red blood cells carry oxygen around the body • White blood cells work to fight disease and illness • *Plasma is made up of water and protein and carries the blood cells and platelets around the body.* • *Platelets help to stop bleeding when you are cut.* *Common Misconceptions to address:* • *Blood is blue when it is deoxygenated – not true: blood is always red (it is a deeper, darker red when deoxygenated and hence looks bluer on skin surface)* *vocab: heart, lungs, artery, vein, capillary, blood, red cell, white cell, oxygen, ventricle, atrium. Oxygenated, deoxygenated, circulatory system, gas exchange,* **Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.** I know: • Diet is the most important factor in weight. • A healthy, balanced diet will ensure your body is at its most efficient. • Short term effects of exercise: increased heart rate, stronger pumps, increased breathing speed and depth, increased heat, sweat. • Long term effects of exercise: slower, more efficient heart, larger heart, greater lung capacity, more efficient lungs, muscle growth, mental health benefits. • Effects of drugs on body – look at alcohol, general illegal drugs • Effect of lifestyle – look at smoking, drinking, laziness, overeating

		vocab: skeleton, head, limbs, arms, legs, fins, gills, wings, tail, thorax, abdomen **Identify the basic parts of the human body and which part of the body is associated with each sense.** I know: • a variety of main body parts (head, shoulders, chest, arms, legsstomach, feet, hands, knee, elbow, bottom, back) • Sight = eyes, Hearing = ears, Smell = nose, Taste = tongue, Touch = skin *Common Misconceptions to address:* • *You use your hands to touch – any part of your skin can sense touch.* • *You use your mouth to taste – only the tongue has taste buds.* *vocab: head, shoulders, torso, chest, limbs, arms, legs, feet, hands, knee, elbow, "belly"- stomach, bottom, back.* *sense; taste - tongue, mouth; sight - eyes; hearing - ears, sound; touch - fingers, skin, nerves; smell - nose*	• *Sleep doesn't affect your health.* • *You only need to wash your hands before you eat.* • *"Diet" means being "on a diet"* *vocab: hygiene, nutrition, exercise, food, wash, clean, brush, sleep, healthy, unhealthy, disease, illness, weight, germs, balanced diet (fruit, veg, meat, protein, carbohydrates, fats, dairy – Plus examples of these)*		*Common Misconceptions to address:* • *Teeth are all the same.* *Vocab: teeth, incisor, canine, pre-molar, molar, jaw, enamel* **Construct and interpret a variety of food chains, identifying producers, predators and prey.** I know: • How to build a food chain. • Arrows show "eaten by" or transfer of energy. • producers are plants – they produce their own food. • prey is the name for animals which are eaten by others. • predators are animals which eat other animals. • an animal can be both predator and prey – eg a fox. • an apex predator is a predator which is not eaten by any other animals. *Common Misconceptions to address:* • *the arrows show what something eats.* • *animals can only be predator or prey.* *Vocab: producer, predator, prey, apex predator, food chain*		compared to healthy lifestyle. *Common Misconceptions to address:* • *Exercise means immediate effects – stress long term benefits* • *Exercise is more important than diet when it comes to weight.* *Vocab: diet, exercise, drug, weight, addiction, illness, fitness, health, alcohol, tobacco, illegal drugs, medicine, prescription* **Describe the ways in which nutrients and water are transported within animals, including humans.** I know: • Nutrients and water are transported via the blood. • Nutrients diffuse into the blood from the stomach & intestines and are transported around the body. • Waste water is taken to the bladder to be removed. *Common Misconceptions to address:* • *Nutrients stay within the digestive system.* *Vocab: digestive system, circulatory system, nutrient, circulation, arteries, veins, stomach, intestines, bladder, excrete*
Living things and their habitats	**Recognise that humans share the world with animals and plants and these can change over time.** Pupils will know that: • Humans share the world with plants and animals. • Plants and animals are living things. • Some animals and plants might live with us (look at pets, house/garden plants) • Plants and animals change over time (link to seasonal changes – hibernation, leaves falling off trees etc).		**Explore the differences between things that are living, dead, and things that have never been alive.** Pupils will know: • the features of living things (MRS GREN – Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion, Nutrition) • that a dead plant or animal used to be alive. • things which have never been alive. *Common Misconceptions to address:* • *Picked plants are living* • Plants can't move		**Identify that living things can be grouped in a variety of ways.** Pupils will know: • Living things have characteristics by which they can be grouped. • Identify some characteristic of each of main living thing types. • Main types of living thing are: reptile, mammal, amphibian, bird, fish, insect, arachnid, plant Common misconceptions to address: • *spiders are insects.*	**Know the differences in the life cycles of a mammal, an amphibian, an insect and a bird.** Pupils will know: Different types of organism have different life cycles. • Mammals life cycle – live birth, child, adult, • Amphibian – egg birth, tadpole, adult (start in water, end on land) • Bird – egg, chick, adult • Insect – egg, larvae, pupa, adult *Common Misconceptions to address:* • Mammals don't have eggs - internal.	**Classify living things into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.** **Give reasons for classifying animals and plants based on specific characteristics.** Pupils will know: • Living things have different characteristics (nocturnal, plant, animal, herbivore, winged, predators etc) • Scientists have developed a universal way to group organisms. Carl Linneaus

	• Recognise that plants and animals grow. • that plants generally grow from seeds or bulbs planted in the ground. • Name some animals and types of animals (eg insects/minibeasts) • some animals are born live and some come from eggs (link to knowledge of human babies and chicks. • Recognise some animals have three clear stages – eg caterpillar-cocoon-butterfly • that animals live in different habitats. • general classifications of some animals eg farm animals, zoo animals, pets *Common Misconceptions to address:* • *It always snows in Winter* • *It can only snow in Winter* • *Birds/fish aren't animals* • *Humans aren't animals* vocab: animals, pets, plants, seeds, bulbs, flowers, trees, living things, baby, young, old, born, hatch, grow, habitat		*Vocab: living, dead, never lived, movement, respiration, sensitivity, nutrition, excretion, reproduction, growth* **Identify and name a variety of plants and animals in their habitats, including micro-habitats.** Pupils will know: • the difference between a habitat and micro-habitat. • Identify a variety of plants and animals which live in given habitats. • a variety of plants and animals which live in given micro-habitats. *Common Misconceptions to address:* • *A plant can't be a habitat* • *Urban areas aren't habitats* *Vocab: plants, animals, habitats, micro-habitats* **Identify that most living things live in habitats to which they are suited and different habitats provide for the basic needs of different kinds of animals and plants, and they depend on each other.** Pupils will know: • Identify a variety of habitats (forest, grassland, desert etc) • Identify a variety of plants and animals which live in given habitats. • Recognise ways in which animals/plants are suited to their habitats (polar bears are white with hollow fur, camels store fat… • Environmntal change can affect animals and lants that live there *Common Misconceptions to address:* • *a desert is hot (Note – no rain; Antarctic also desert),* • *Camels store water – actually fat* *Vocab: habitat, suitability, adapted, damp, humid, shade, shelter,*		*Vocab: reptile, mammal, amphibian, bird, fish, insect, arachnid, plant* **Explore how classification keys can help group, identify and names of a variety of living things in their local and wider environment** Pupils will know: • We would use a classification key when we see an animals which we are unsure of. *Common Misconceptions to address:* • *Classification keys are the only way to classify animals.* *vocab: classification key, environment, suited, identify* **Recognise that environments can change and that this can sometimes pose dangers to living things.** **Pupils will know:** • Environments can change. • Humans can affect the environment. • Environment changes can affect plants and animals living there. • Environment change can be dangerous for living things. *Common Misconceptions to address:* • *Only humans can cause environment change.* • *All environmental change created by humans is 'bad'* *Vocab: environment, climate, adapt, danger*	• tadpoles are only baby frogs. *Vocab: life cycle, grow, mature; mammal - young, baby, live birth,; insect - egg, larvae, pupa, adult; amphibian – egg/spawn, tadpole, adult; bird - egg, chick, adult* **Describe the life process of reproduction in some plants and animals.** Pupils will know: • Asexual reproduction is where the parent reproduces completely on its own. This is most common in plants but can also happen rarely in a snasmall number of animals • Sexual reproduction is where two parents mate and reproduce, with the eggs of one being fertilised by the other. • Understand the difference between internal fertilisation (eg mammals, reptiles, birds) and external fertilisation (eg fish,frog) • A basic understanding of human sexual reproduction. *Common Misconceptions to address:* • *Mammals (including humans) do not produce eggs.* *Vocab: reproduction, egg, ovary, sperm, live birth, internal/external fertilisation, incubate, young, sexual, asexual, seeds*	developed the system used today • Each group has common characteristics. • Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. • Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. *Common Misconceptions to address:* *Vocab: micro-organism, plant, animal, vertebrate, invertebrate, mammal, reptile, fish, bird, insect, amphibian, crustacean, arachnid, flowering, non-floweringpopulation, Linnean,*

			Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and different sources of food. Pupils will know: • A Producer starts every food chain. It is always a plant. • All energy comes from the sun • All animals are consumers. • Animals which eat other animals are predators. Animals eaten by other animals are prey. • An animal can be both predator and prey (eg fox) • An animal with no predators is an apex predator. • The arrows in a food chain show "is eaten by". • Identify/create a food chain with at least three links. *Common Misconceptions to address:* • *Arrows show what the animal eats.* • *Plants can't be consumers (Venus fly trap)* • *An animal is either predator or prey but not both.* *Vocab: food chain, food source, predator, prey, producer, consumer, apex predator*				
Seasonal changes	**Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.** Pupils will know: • Day and night • Recognise the Sun and moon. Seasons: • The year is separated into four seasons. • Winter is cold. • Spring is getting warmer. • Summer is hot. • Autumn gets cooler. • Christmas is in Winter. • Easter is in Spring • Spring is associated with new life.	**Observe and describe changes across the four seasons.** Pupils will know: • Months in each season. • Deciduous trees lose their leaves in Autumn/Winter • New life in Spring (plants and animals) • Changes in appropriate clothing *Common Misconceptions to address:* • *All plants lose their leaves in Autumn/Winter* • *No flowering plants can survive in Winter (snowdrops, pansies)* *Vocab: names of all 12 months, change, season, Spring,*					

	• Leaves fall off many trees in Autumn • Some animals hibernate over Winter • We wear different clothes at different times of year. Changing States • When snow/ice melts it turns to liquid. It melts when it is warm. • If water is frozen it becomes solid ice *Common Misconceptions to address:* • *Moon only comes out at night.* • *It always snows in Winter* • *It can only snow in Winter* vocab: change, season, Spring, Summer, Autumn, Winter, melt, freeze, new life, hibernate, burn, solid, liquid **Recognise that weather and temperature is not always the same.** Pupils will know: • There are different types of weather. • about and be able to describe: rain, snow, sun, wind, cloudy. • generally in which seasons it rains more and in which it is sunnier. • generally in which seasons it is cooler and in which it is warmer. • the connection between weather and temperature: eg sunnier usually hotter, wind and rain usually colder. • that rainbows can appear when it is rainy and sunny.	*Summer, Autumn, Winter, deciduous, evergreen* **Observe and describe weather associated with the seasons and how day length varies.** Pupils will know: • *As we move from Winter to Summer, days get longer and nights get shorter. Weather becomes warmer.* • *As we move from Summer to Winter, days get shorter and nights get longer. Weather becomes colder.* • Seasons are linked to the Earth **moving around the Sun**. *Common Misconceptions to address:* • *Seasons are linked to the Earth turning around/spinning.* • *The Earth moves closer to the sun in Summer and further away in winter* *Vocab: weather, colder, warmer, hotter, snow, rain, sun, temperature, day, night, longer, shorter, light, Earth, Sun,*					
Plants		**Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.** Pupils will know: • common flowering plants (daisy, sunflower, tulip, rose, pansy) • common plant types (tree, bush, flowering plant, grass)	**Observe and describe how seeds and bulbs grow into mature plants** Pupils will know: • Show the stages of growth of a typical plant (seed, germination, roots, seedling, stem, leaves, flower, seed dispersal)	**Identify and describe the functions of different parts of flowering plants: roots,stem/trunk, leaves and flowers** Pupils will know: • Identify: roots, stem, leaves, flower, petals. • Name the functions of roots (anchor & nutrition), stem/trunk (support and water transportation),			

		Common misconceptions to address: • *Difference between floweing and non flowing plant* *Vocab: plant, flower, deciduous, evergreen, observe, compare,* **Identify and describe the basic structure of a variety of common flowering plants, including trees.** Pupils will know: • the general structure of a flowering plant (roots, stem, leaves, flowers) • Recognise the general structure of a tree (roots, trunk, branches, leaves, flowers/fruit) • That we can eat different parts of a plant (seeds, stem, root, leaves…) Common misconceptions to address: • *A flower is the whole plant.* • *Picked flowers are living* *Vocab: stem, trunk, leaf, branch, flower, root,*	• Flowers make seeds to make more plants (reproduction) *Common Misconceptions to address:* • Seeds must be planted in the soil (a seed will germinate on tissue paper) *Vocab: seed, bulb, germination, roots, seedling, stem, leaves, mature, flower, seed dispersal, warmth, observe* **Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.** Pupils will know: • Identify plants need water, light and a suitable temperature to grow and stay healthy. *Common Misconceptions to address:* • *How much space a plant has doesn't matter* • *Plants need soil to grow.* • *Plants won't grow at all without light.* *Vocab: suitable temperature, water, sunlight, grow, soil, healthy*	leaves (photosynthesis), flower, petals, stamen and carpel. Common misconceptions to address: • *The roots absorb 'food' for the plant (we should say nutrients)* *Vocab: roots, stem/trunk, leaves, flowers, petals, support, anchor, nutrition, water, transportation, attract, reproduction, sugar, energy,* **Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary between plants.** Pupils will know: • Basic needs – air, light, water, nutrients, room • Most common plants need all of these. • Identify examples of plants which have different requirements (cactus less need for water, orchids don't really need soil, air plants grow on other plants and not in the ground) • Plants are limited by the amount of room they have – discuss repotting plants to allow larger growth. Common misconceptions to address: • *Plants get 'food' from soil* • *Plants without light won't grow* *Vocab: requirements, healthy, air, light, water, nutrients, soil, room, growth, limited, orchid, cactus, air plant* **Know the way in which water is transported within plants.** Pupils will know: • Water is taken into plants by the root. • Water is transported up the stem to the rest of the plant. • Some water evaporates from the leaves. *Common Misconceptions to address:* • *The stem is only for support "It just holds up the plant"*			

				• *A pant can't have too much water* *Vocab: stem, roots, nutrition, water, absorb, transport, evaporate* **Explain the part flowers play in the life cycle of flowering plants including pollination, seed formation and dispersal.** Pupils will know: • Recognise the flower is linked to reproduction in plants. • Plants produce seeds to reproduce. • Name and explain function of parts of flower (petal – attract, stamen (filament/anther) – male: pollen, carpel (ovary, style, stigma) – female: receive pollen. • Pollination – insects and birds going to different flowers carry pollen and fertilise the other. • Some flowers can self-pollinate (peanut, orchid, peas, sunflowers). • Seed dispersal – wind, animals, water, explosion *Common Misconceptions to address:* • *The idea of a "male and female parts of a flower"* • *seeds grow near the parent plant.* • *Seeds have to be bought from a shop* *Vocab: stamen, filament, anther, pollen, carpel, ovary, style, stigma pollination, seed formation and seed dispersal, wind, water, explosion, animal*			
Materials + Rocks and soils	**Understand that not all objects are made from the same materials.** Pupils will know: • *A material is what something is made from.* • Objects can be made from different things. • Name some common materials (wood, brick, stone, glass, plastic, metal, cotton) *Common Misconceptions to address:*	**Distinguish between an object and the material from which it is made.** Pupils will know: • *An object is an item or thing,* • *A material is what the object is made from.;;-* *Common Misconceptions to address:* • *Material is "what clothes are made from."* • *"Material" is the name of a material – "This is made of material."* *Vocab: object, material, made*	**Identify and compare suitability of a variety of everyday materials for particular uses.** Pupils will know: • identify what materials certain items are made from. • why items are made from given materials – eg. Walls made of bricks as they are strong, hard, heavy etc. • why certain materials would be unsuitable for given items – eg a window	**Compare and group different kinds of rocks can be grouped together on the basis of their appearance and simple physical properties.** Pupils will know: • not all rocks are the same. • rocks look different. • rocks can have different properties. Common misconceptions to address: • *All rocks are hard.* • *All rocks are heavy.*	**Compare and group materials together, according to whether they are solids, liquids or gases.** Pupils will know: • All materials are solid, liquid or gas. • Solids have a rigid particle structure, with particles packed close together. A solid cannot be poured. • Liquids have a fluid particle structure with particles further apart which will fill a container	**Compare and group together everyday materials can be grouped together on the basis of their properties. Including, hardness, solubility, transparency, conductivity (electric and thermal), and response to magnets.** Pupils will know: • Group a variety of materials independently based on properties such as hardness, waterproof, density etc.	

	• *Clothes are made from "material"* vocab: material. wood, brick, stone, metal, plastic, glass, cotton	**Identify and name of a variety of everyday materials.** Pupils will know: • Be able to name *wood, plastic, glass, metal, cotton, brick, water, and rock as materials.* *Common Misconceptions to address:* • *All metals are the same* • *All rocks are the same* *Vocab: wood, plastic, glass, metal, cotton, brick, water, and rock* **Describe the simple physical properties of a variety of everyday materials.** Pupils will know: • Be able to describe given materials and give general statements about materials "Cotton is soft.". *Common Misconceptions to address:* • *All metals are hard/rigid* • *All rocks are hard* • *All wood is hard/rigid* • *Rigid, strong and hard are the same thing (rigid – doesn't bend, strong – is able to withstand force/pressure without changing shape, hard – not easy to break)* • *soft is the same as smooth.* *Vocab: property, rough, smooth, hard, soft, strong, weak, rigid, flexible* **Compare and group together a variety of everyday materials on the basis of their simple physical properties** Pupils will know: • Be able to group a variety of materials based on physical properties. *Vocab: property, rough, smooth, hard, soft, strong, weak, rigid, flexible*	is not made from brick because it is not transparent Common misconceptions to address: • *Vocabulary e.g. difference between transparent and translucent.* *Vocab: suitable, unsuitable, wood, metal, plastic, glass, brick, rock, paper, cardboard* **Find out how shapes of solid objects made from some materials can be changed by *squashing, bending, twisting and stretching.*** Pupils will know: • Solids do not change shape on their own. • A force must be applied to change the shape of a solid. • Solids can be squashed, bent, twisted or stretched. • Different solids may take a different amount of force to change shape. *Vocab: squashing, bending, twisting and stretching*	*Vocab: rock, hardness, metamorphic, igneous, sedimentary, density* **Describe in simple terms how fossils are formed when things that have lived are trapped within rock** Pupils will know: • Fossils are caused by dead animals/plants. • Dead matter is trapped within rock and compressed over thousands/millions of years. • Dead matter rots/decays and the imprint is left behind. • Fossil casts can be created by pouring plaster into the space left by dead matter. Common misconceptions to address: • *Fossils are always the actual remains of the living thing.* *Vocab: fossil, fossilisation, dead, rot, decay, cast* **Recognise that soils are made from rocks and organic matter.** Pupils will know: • Soil is made from broken down rock & organic matter. • Soil is formed over time. Common misconceptions to address: • *Soil is something completely different to rock/organic matter. "It's just dirt."* *Vocab: soil, rock, organic matter*	from the bottom. Liquids can be poured. • Gases have a very fluid particle structure with particles which expand to fill a container. Gases can be poured but will expand into the space. *Common Misconceptions to address:* • *salt etc are not solid because they can be poured.* *Vocab: solid, liquid, gas, particle structure, rigid, fluid, expand, pour.* **Observe that some materials change state when they are heated or cooled, at different temperatures in degrees Celsius (°C** Pupils will know: • Adding or reducing heat can change the state of an object. • solids can be melted into liquid. • liquids evaporate into gas • gas condenses into liquid. • liquid freezes into a solid. • Different materials change state at different temperatures. *Common Misconceptions to address:* • All materials have the same freezing/ boiling points. • All materials change state this way (eg wood burns, doesn't melt.) *vocab: change state, heat, cool, temperature, degrees Celsius* **Identify the part played by evaporation and condensation plays a part in the water cycle and the rate of evaporation is affected by temperature.** Pupils will know: • water on Earth is all part of the water cycle. • evaporation cause water to become gas and rise into the air. • condensation creates clouds. • When the clouds are heavy enough, the water falls as rain.	*Common Misconceptions to address:* *Vocab: hardness, solubility, transparency, conductivity (electrical and thermal), and attract/repel magnets* **some materials will dissolve in liquid to form a solution, and how to recover a substance from a solution.** Pupils will know: • Some materials dissolve in liquid to form a solution. • Dissolving is a reversible change. • Substances can be recovered from a solution. *Common Misconceptions to address:* • *Substances "disappear" in a liquid.* • *Once a substance has dissolved it is gone forever.* *Vocab: substance, dissolve, solution, reversible,* **Explain how mixtures might be separated** Pupils will know: • A mixture can be separated. *Common Misconceptions to address:* • *A mixture of very small things is impossible to separate.* *Vocab: mixture, filtering, sieving, evaporating separate* **Give reasons for the particular uses of everyday materials for specific products, including metals, wood and plastic** Pupils will know: • Identify, using properties, why given materials are used for specific products. *Common Misconceptions to address:* • *metals are always solid (look at mercury use in thermometers)* *vocab: properties, products, suitable, unsuitable, metal, wood, plastic* **Demonstrate that dissolving, mixing and changes of state are reversible changes.** Pupils will know:	

					• When the temperature is warmer, water evaporates faster. *Common Misconceptions to address:* • *clouds aren't made from water.* • *Water only evaporates when the weather is 100°C* *Vocab: evaporation, condensation, water cycle, temperature*	• Dissolving, mixing and changes of state are reversible changes. • Understand a reversible change means the original material can be retrieved. • Reversible changes are a physical change *Common Misconceptions to address:* • *The original material will look exactly the same – eg sugar crystals.* *Vocab: reversible, physical, dissolving, mixing, change of state* **Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.** Pupils will know: • Irreversible change forms new materials. • Irreversible changes are a chemical change. • Understand an irreversible change means the original is gone forever. • Recognise burning is irreversible. *Vocab: chemical, formation, material, burning, acid*	
Forces and Magnets				**Compare how things move differently on different surfaces.** Pupils will know: • that items move differently on different surfaces. • the concept of friction. • friction is a pulling force – pulls against movement. • Predict how an item will move on a given surface eg. Ice/ gravel. • friction can create heat. *Vocab: movement, friction, surface, pull, heat* **Notice that some forces need contact between two objects, but magnetic forces can act at a distance.** Pupils will know:		**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.** Pupils will know: • Forces are a push or a pull. • Gravity is a pulling force produced by the Earth. • Gravity pulls towards the centre of the Earth. • All objects have gravity, but an object has to be truly massive to allow the gravity to have an effect. *Common Misconceptions to address:* • *Gravity pulls "down" – it pulls towards the centre of the Earth,*	

				• Know forces as a push or pull. • Recognise that most forces are a push or pull between two objects through contact. • Recognise magnetism acts at a distance. Common misconceptions to address: • *All forces need contact.* *Vocab: force, contact, magnetic, push, pull, distance* **Know that magnets have two poles and predict whether two magnets will attract or repel each other, depending on which poles are facing.** Pupils will know: • Magnets have two poles – North and South. *Vocab: magnet, pole, North, South* two magnets will attract or repel each other, depending on which poles are facing. Pupils will know: • Magnets can attract and repel. • Like poles (S/S, N/N) repel • Opposite poles (S/N) attract. Common misconceptions to address: • *Definition of repel – some children think if it doesn't attract something (eg wood) it repels it – not true, it just has no effect.* *Vocab: magnet, pole, North, South, like poles, opposite poles, attract, repel, metal, magnetic* **Compare and group together a variety of everyday materials based on whether they are attracted to magnets and identify some magnetic materials.** Pupils will know: • Magnets can attract materials or have no effect on them. • Magnets only attract metals. • Magnets do not attract all metals.		*Vocab: gravity, push, pull, force, centre, mass, fall* **Identify the effects of air resistance, water resistance and friction all have an effect when they act between moving surfaces.** Pupils will know: Air resistance acts when something moves through the air. • Water resistance acts when something moves through water. • Friction acts when something moves against a solid. • Air resistance, water resistance and friction are all pulling forces. *Common Misconceptions to address:* • *There is no resistance moving through the air.* *Vocab: air resistance, water resistance, friction, surfaces* **Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.** Pupils will know: • Basic knowledge of what levers, pulleys and gears are and how they work. • The longer the lever, the less force needed to move the object. *Common Misconceptions to address:* • *If you apply the force close to the object it will have greater effect (use eg of door – we push further from the hinges to make it easier).* *Vocab: mechanism, lever, pulley, gear, force, apply,*	

				• Identify whether a material is magnetic or not. Common misconceptions to address: • *Magnets attract **all** metals.* *Vocab: magnetic, attract, metal, North and South poles*			
Light + Sound				**Recognise that we need light in order to see things and that dark is the absence of light.** Pupils will know: • Light is created by a light source. • Light is required to see. • Darkness is the absence of light. *Common Misconceptions to address:* • *The moon is a light source.* • *Reflective surfaces (eg high-vis) are light sources.* *Vocab: light source, darkness, light, sight* **Notice that light is reflected from surfaces.** Pupils will know: • Light is reflected off surfaces. We see when the light is reflected into our eyes. *Common Misconceptions to address:* • *The moon is a light source.* • *Reflective surfaces (eg high-vis jackets) are light sources.* • *"Reflective surface" means mirror.* *Vocab: reflect, reflective, surface, eyes* **Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.** Pupils will know: • The Sun is a light source. • The Sun is so bright it can harm our eyes. • Other bright lights can harm our eyes. • We can protect our eyes (sunglasses, shade, coloured lenses).	**Know how sounds are made, associated with something vibrating.** Pupils will know: • Sound is caused by vibration *Vocab: sound, vibration.* **Know that vibrations from sounds travel through a medium to the ear,** Pupils will know: • Sound travels via vibration. • Sound can travel through gas, liquid or solid media. *Common Misconceptions to address:* • Sound only travels through air. *Vocab: vibration, medium, ear, solid, liquid, gas* **Recognise that there are patterns between the pitch of a sound and features of the object that produced it.** Pupils will know: • Pitch (high/low) is determined by the speed of the vibrations. • Pitch is affected by the features of the vibrating object. *Common Misconceptions to address:* • Pitch/volume mixed up. *Vocab: pitch, high, low, vibration* **Recognise that there are patterns between the volume of a sound and the strength of the vibrations that produced it.** Pupils will know: • Volume (loud/quiet) is determined by the strength of the vibrations. • Louder sounds are created by stronger vibrations.		**Recognise that light appears to travel in straight lines.** Pupils will know: • Light is created by a light source. • Light moves in straight lines. • Light can be bent. • Light can be split. *Vocab: light, light source, ray, straight line, bend, refraction, rainbow* **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.** Pupils will know: • Main parts of the eye (pupil, iris, cornea, retina) • The pupil is where the light enters our eye. • The retina is where the light is received by our eye and the information is then sent to the brain. • Eyes are "input" organs, not "output" – they receive light and interpret it. They do not actively "see". *Common Misconceptions to address:* *Vocab: reflect, eye, eyeball, pupil, iris, cornea, retina* **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.** Pupils will know: • Light is created by a light source. • We see when light enters our eye and is read by the retina. • *Light reflects from objects into our eyes, and this is how we see.*

				Common Misconceptions to address: • *If you look directly at the sun for even a second you will go immediately blind.* • *You can only harm your eyes by looking directly at the sun (reflection in highly reflective surfaces can also harm, as can other light sources)* • *If you wear sunglasses you can stare directly at the sun for as long as you want.* • *Wearing sun cream will protect your eyes.* *Vocab: rays, harm, sun, light, bright, protection, blindness, danger* **Recognise that shadows are formed when the light from a light source is blocked by an opaque object.** **Pupils will know:** • Shadows are formed when light is blocked. • Shadows can change size and shape. *Common Misconceptions to address:* • *Transparent objects can't have a shadow (eg glass windows – they do cast a very, very pale shadow)* *Vocab: light source, shadow, block, opaque, transparent* **Findthere patterns in the way that the size of shadows change.** Pupils will know: • Shadows can change size and shape. • The closer the light source to the object, the bigger the shadow, and vice versa. • The angle of the light source to the object will change the shape of a shadow. *Common Misconceptions to address:* • *Only big things can have big shadows.* *Vocab: light source, shadow, block, opaque, shape, size, distance, angle*	*Common Misconceptions to address:* • Pitch/volume mixed up. *Vocab: volume, loud, quiet vibration, strength* **Know that sounds get fainter as the distance from the sound source increases.** Pupils will know: • Sound dissipates over distance. • Sound gets fainter as it moves further from its source. *Common Misconceptions to address:* • Sound is as fast as light. *Vocab: faint, vibrations, distance, wave*		*Common Misconceptions to address:* • *We see because we "look at" an object.* • *Squinting your eyes will help you see better.* *Vocab: light source, travel, straight line* *reflect, retina, sight* **Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.** Pupils will know: • An object can only cast the shape of itself. • The shape can be stretched or compressed by the angle of the light. • The shape can be made larger or smaller by the distance from the light source. *Common Misconceptions to address:* • A shadow can only be the same size as the object. • A shape can cast different shaped shadows – the shape can be stretched or change size, but will be the same shape. *Vocab: light source, shadow, block, opaque, shape, size, distance, angle, cast*
Electricity	**Understand electricity exists and can be dangerous.** Pupils will know:				**Identify common appliances that run on electricity.** **Pupils will know:**		**Associate the brightness of a lamp or the volume of a buzzer is affected by the**

	• Electricity is what makes many things work – be able to name some. • Identify plugs and plug sockets are linked to electricity. • electricity can be dangerous. • not to play with plug sockets. • Lightning is electricity. *Common Misconceptions to address:* • *Plugs are safe.* • *Lightning is "made of light"* vocab: electricity, electrical, plug, plug socket, dangerous, lightning				• a variety of common appliances using electricity (kettle, microwave, clock, shower, toaster etc) • *safety when using electricity* *Common Misconceptions to address:* • *some appliances children may not realise use electricity – eg showers* *Vocab, electricity, plug, wire, battery* **Construct a simple circuit, identidfying and naming its basic parts including cell, wire, bulb, buzzer, switch** Pupils will know: • *A circuit is a path for electricity.* • *A component is a part of a circuit.* • *A cell is the power source.* • a battery is more than one cell together. • wires connect components. • bulb is a component that gives out light. • buzzer is a component which gives out sound. • *A motor is a component which produces movement.* • *A switch is a component which can make or break a circuit.* *Common Misconceptions to address:* • a cell is a battery. *Vocab: circuit, cell, battery, wires, bulb, switch, buzzers and motors., component,* **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.** Pupils will know: • identify a circuit must be a complete loop with a cell/battery to work. Common misconceptions to address: *Vocab: complete, incomplete, loop, battery, bulb* **Recognise that a switch opens and closes a circuit**		**number and voltage of cells used in the circuit.** Pupils will know: • More/higher voltage cells in a circuit: brighter lamp/louder buzzer etc. • Less/lower voltage cells in a circuit: duller lamp/quieter buzzer etc. Common misconceptions to address: • *It doesn't matter how many cells there are, "a light is a light" etc* *Vocab: cell, voltage, brightness, bulb volume, buzzer, 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.** Pupils will know: • *As above with cell quantity/ voltage.* • *A switch will cause components to begin/cease performing.* Common misconceptions to address: • *A switch is the only way to affect performance of components.* *Vocab: component, performance, bulb, buzzer, switch* **Recognise and use symbols for representing a simple circuit in a diagram.** Pupils will know: • Use correct symbols for: wire, cell, buzzer, bulb, switch, motor • Accurately draw simple circuit diagrams. *Common Misconceptions to address:* • *a cell is a battery – not that a battery is made of multiple cells.* *Vocab: symbol, circuit diagram, wire, cell, buzzer, bulb, switch, motor*

					and determines whether or not a lamp lights in a simple series circuit. Pupils will know: • A switch can be open or closed. • An open switch breaks the circuit. • A closed switch completes the surface. • open: off – closed: on *Vocab: series circuit, switch, break, open, closed* **Know the difference between conductors and insulators, and name examples of each e.g. metals are good conductors.** Pupils will know: • a conductor is a material electricity can travel through. • an insulator is a material electricity can't travel through. • Identify some conductors (metal, graphite etc) • Metals are particularly good conductors, which is why wires are made from metal. • Identify some insulators (wood, plastic etc) Common misconceptions to address: • *electricity can travel through anything.* • *electricity can only travel through metal.* *Vocab: conductor, insulator, metal*		
Earth and Space	**Understand the sun can be dangerous.** Pupils will know: • The sun produces heat and light • It is dangerous to look at the sun because it can hurt your eyes. • It is dangerous to be out in the sun too long as it can burn your skin. • Sun cream is good protection for skin. • Sunglasses are protection for eyes • A cap can protect the eyes and face. *Common Misconceptions to address:*					**Describe the the movement of the Earth, and other planets, relative to the Sun in the solar system.** Pupils will know: • The names and order of the planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto-note "dwarf planet") • The relative sizes of the planets. • Different types of planets (rock, gas giants, dwarf planets) • General facts – eg Saturn's rings.	

	• *The Sun isn't hot in Winter.* • *If it isn't very hot, you can't get sunburn.* • *Sun cream means you can't get burnt.* • *sunglasses mean your eyes can't be hurt by the sun.* vocab: Sun, light, heat, hot, burn, sunburn, sun cream, bright, blind, sunglasses, cap					• Earth and the other planets orbit the sun. • One orbit of the sun is known as a year. • Earth's year is 365 days, 6 hours, 9 minutes and 10 seconds (a sidereal year). The extra hours are made up every 4 years as an extra day – A Leap Year. • The planets take different times to orbit the sun (length of a "year" is different). • The orbits of the planets are different shapes and none are exactly circular. *Common Misconceptions to address:* • *The Sun goes around the Earth.* • *Orbits are circular.* • *Planets are evenly spaced out.* • *A year is the same for all planets.* • *All planets are made of rock.* *Vocab: Earth, Sun, solar system, Milky Way, planet (planet names), orbit, sidereal, year, rocky planet, gas giant,* **Identify that the Sun, Earth and Moon are approximately spherical bodies.** Pupils will know: • Sun, Earth and Moon are approximately spherical. • None of them are exact spheres. • *A spinning force called centrifugal force, that pushes the centre of things outwards causes planets to be spherical in shape.* *Common Misconceptions to address:* • *Planets are exact spheres* *Vocab: Earth, Sun, Moon, sphere, approximate, spherical* **Describe the movement of the Moon relative to the Earth.** Pupils will know: • Understand that the Moon orbits the Earth. • The Moon's orbit is 17pprox.. 28 days which is 17pprox.. one month	

						Common Misconceptions to address: • *The moon orbits the Sun.* • *The Moon's orbit is one month (each month is different)* • *The Moon is the only moon –other planets have many moons.* • The moon is a planet *Vocab: moon, Earth, orbit, month, Lunar Month, New Moon, Crescent, Half, Gibbous, Full, Waxing, Waning, Lunar Eclipse* **Describe the ideas that the Earth's rotation explains day and night and the apparent movement of the sun across the sky.** Pupils will know: • The Earth turns on its axis. • Earth takes approx.. 24 hours (23 hours, 56 mins – called the sidereal period) to spin on its axis. • The axis is the reason for the seasons – when tilted away from the Sun, it is Winter, towards the Sun is Summer. Also explains shift in length of day/night. *Common Misconceptions to address:* • *Earth is straight up – North Pole perfectly on top, South Pole perfectly on bottom.* • *Sun goes round the Earth.* • *The Earth spins slower in Summer/Winter so the day/night is longer.* • *The earth moves closer to the sun in seummer and further away in winter,* *Vocab: rotation, day, night, axis, tilt, poles, North Pole, South Pole, hemisphere*	
Evolution and inheritance							**Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.** Pupils will know: • Many species are extinct. We only know what we

							have learned from fossils or written/art sources. • Most living things have changed over time – they may have become bigger, smaller, or changed their diet to survive. • Fossils provide information about many extinct species, but particularly dinosaurs. Common misconceptions to address: • *The Earth was made in 7 days* • *Dinosaurs are not real.* • *Dragons existed.* • *Fossils are always the actual bone – can be imprints, impressions, DNA etc* *Vocab: evolution, imprint, impression, DNA, fossils, evidence,* **Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.** Pupils will know: • Living things produce offspring of the same kind (eg humans produce humans, tulips produce tulips) • Offspring generally share similarities with their parents. • Most offspring have differences to their parents. Common misconceptions to address: • *Offspring are exactly like parents.* • *Offspring are exactly 50% of each parent.* • *Nothing produces exact replica offspring (some asexual do produce replicas)* *Vocab: offspring, reproduce, adapted, similar, varied, parents, genes* **Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.** Pupils will know:

							• Animals and plants adapt to their environments. • The best suited of animals and plants survive better. • Competition exists for resources and mates • Eventually an adaptation can lead to permanent change in a species (eg peppered moth originally 98% white, 2% dark. After industrial revolution 95.5% black because white ones could no longer hide due to pollution). • Permanent change in a species is known as evolution. Charles Darwin was a scientist who originally shared the theory of evolution by natural selection. • Evolution can take hundreds, thousands, even millions of years. Common misconceptions to address: • *God made everything how it is.* *Vocab: suited, species, adaptation, permanent, evolution, inheritance, characteristics, genetics, variation, competition, survival*

Long term plan/overview:

*Key stage 1 will also observe the seasons throughout the year to observe changes in weather, daylight hours and changes relating to the seasons.

Year Group	Cycle 1				Cycle 2		
	Autumn	Spring	Summer		Autumn	Spring	Summer
Foundation							
Year 1/2	Materials	Habitats	Animals including humans (Humans)		Materials/Forces	Animals including humans (Animals)	Plants
Year 3/4	Electricity Habitats	Animals including humans	States of matter		Rocks and Soils Sound	Light Forces	Plants
Year 5/6	Animals including humans	Earth and Space	Electricity Light		Forces Evolution and inheritance	Living things and their habitats + classification	Properties and changes of Materials