

Topic: Animals including humans (Biology)

	NC objectives	Key questions	Key vocabulary
Reception	Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.	<p><u>Key questions</u></p> <p>What are minibeasts?</p> <p>* Explore the natural world around them, making observations and drawing pictures of animals and plants.</p>	Egg, chick, bird, caterpillar, cocoon, chrysalis, butterfly, frog spawn, tadpole, froglet, frog, grow, change, die, names of animals and their young, fur, feathers, scales, tail, wings, beak, claws, paws, hooves, swim, walk, run, jump, jump, fly, patterns, spots, stripes
KS1 Cycle A	<p>Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. (Y2 - Living things and their habitats)</p>	<p><u>Key questions</u></p> <p>How are animals similar and different to their offspring?</p> <p>* Enquiry - Compare the adult and their young and match them,</p> <p>How do humans and animals change as they grow?</p> <p>* Beetle life cycle (order stages and describe), human growth (order stages)</p> <p>* Enquiry - do older children always wear bigger shoes?</p> <p>MATHS LINK (measuring and completing table)</p> <p>What does an animal need to survive?</p> <p>* Enquiry - Ask pet owners questions</p> <p>* Make a poster about caring for a pet</p> <p>How can we be hygienic?</p> <p>* Enquiry - what is the best way to wash our hands (water, water and soap, warm water and soap)</p> <p>What foods should we eat to have a balanced diet?</p> <p>* Enquiry - Classify food into different food groups</p> <p>Where does our food come from?</p> <p>What happens to our bodies when we exercise?</p> <p>* Enquiry - Investigate heart rate when completing different exercises</p>	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)

		MATHS LINK (tally chart)	
KS1 Cycle B	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Key questions How can we categorise animals? * Enquiry - Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>What are carnivores, omnivores and herbivores? * Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>What are the structures of different animals? * Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>What are the five senses? * What is the structure of the human body? * Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> <p>Which part of the body is linked to taste/hearing etc? * Enquiry - tasting foods, listening etc and considering which body part is being used.</p>	<p>Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves</p> <p>Names of animals experienced first-hand from each vertebrate group • Parts of the body including those linked to PSHE teaching</p> <p>Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue</p>
LKS2 Cycle A	<p>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.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Key questions What are nutrients? * Identify the nutrients found in foods and the purpose they have in supporting our bodies.</p> <p>How can food labels help us to understand what we eat? * Enquiry - Use food packets to look at and identify the nutrients in them and find the value - can children recognise if this is a good food choice. MATHS LINK (using figures to understand nutritional value)</p> <p>How are skeletons different? * Enquiry - Identify the different skeleton types of different animals - classify and sort into groups.</p> <p>What is my skeleton? * Look at the bones in the human skeleton - identify the purpose of some of these bones for our bodies. Compare differences in skeletons.</p>	<p>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine</p>

		<p>Why do we need muscles?</p> <ul style="list-style-type: none"> * Identify the role muscles have in allowing us to move - contract and relax. * Make a muscle model. 	
<p>LKS2 Cycle B</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>Key questions</p> <p>What is the function of teeth?</p> <ul style="list-style-type: none"> * Understand the characteristics of different types of teeth. * Enquiry - compare, contrast and group the jaw bones and teeth of different animals. <p>How does the digestive system work?</p> <ul style="list-style-type: none"> * Hands-on digestive system practical * Explanation text write-up <p>What effect does what we eat have on our teeth?</p> <ul style="list-style-type: none"> * Eggs are left in different liquids over time. Observing effects on the shells. <p>How do food chains work?</p> <ul style="list-style-type: none"> * Enquiry - Researching what animals in habitats around the world eat. * Creating simple food chains from different ecosystems. 	<p>Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain</p>
<p>UKS2 Cycle A</p>	<p>Describe the changes as humans develop to old age.</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats)</p> <p>Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)</p>	<p>Key questions</p> <p>What is the life cycle of a human?</p> <ul style="list-style-type: none"> * Stages in the growth and development of humans from birth to death, named and with details * Timeline * What impact does having a healthy lifestyle have? <p>How do babies grow and develop?</p> <ul style="list-style-type: none"> * Look at growth in the first year of life * Enquiry - Use graphs to compare data in age and height <p>MATHS LINK (line graph)</p> <p>What happens to our mind and body when we get older?</p> <ul style="list-style-type: none"> * Explore physical and mental changes that happen in old age * Sort statements into true and false * Give ways to help our mind and bodies stay health in old age <p>What questions can we ask a health expert?</p> <ul style="list-style-type: none"> * Enquiry - developing questions as a class to ask an expert <p>Puberty - Covered in SRE</p>	<p>Puberty – the vocabulary to describe sexual characteristics</p>

		<p>* Describe the changes as humans develop to old age by comparing the changes that take place to boys and girls during puberty.</p> <p>Farming links:</p> <ul style="list-style-type: none"> • Why does farming matter to us? • How have we adapted our own habitats to make way for farming? • How much of our Earth is used for farming? 	
<p>UKS2 Cycle B</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. • Describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>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. (Y6 - Living things and their habitats)</p> <p>Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)</p>	<p>Key questions</p> <p>What are the vital organs?</p> <p>* Recapping the organs of the body and identifying which are vital organs and which a human can live without. Roles of the vital organs.</p> <p>What is blood made from?</p> <p>*Enquiry - Making a 'blood smoothie' to learn about the components of blood and their roles.</p> <p>How does the heart work?</p> <p>* Identifying the parts of the circulatory system and the function of the heart.</p> <p>* Can I identify the parts of a heart? - heart dissection.</p> <p>How do the lungs work?</p> <p>* Continuing the work on the circulatory system, making a representation of the lungs.</p> <p>How long does it take heart rate to recover after exercise?</p> <p>* Enquiry - measuring heart rate through a range of activities and the pace at which is slows back to a normal rate.</p> <p>MATHS LINK (line graph)</p> <p>How can lifestyle affect our health?</p> <p>* Learning about the impact of diet, exercise, drugs and alcohol on the heart and the body as a whole.</p> <p>Which nutrients does a body need to stay healthy?</p> <p>* Looking at the transportation of nutrients and why a healthy diet is essential to get these nutrients into the body.</p> <p>* Enquiry - how are nutrients transported in the body?</p> <p>Farming links:</p> <ul style="list-style-type: none"> • How similar is our DNA to that of pigs? • Should we breed animals for organs? 	<p>Human body, organ, liver, kidney, heart, lungs, brain, stomach, intestines, gall bladder, pancreas, esophagus, spleen, blood, blood vessel, blood cell, plasma, haemoglobin, oxygenated, deoxygenated, chamber, vein, capillary, artery, valve, atria, pump, aorta, pulmonary artery, cardiac, myocarditis, transplant, cardiopulmonary resuscitation, defibrillator, bronchi, trachea, bronchiole, diaphragm, alveoli, heart rate, pulse, exercise, energy, heart monitor, diet, exercise, drugs, alcohol, smoking, cancer, clogged arteries, blood clots, health, nutrient, micronutrient, fibre, vitamin, water</p>

Topic: Evolution and Inheritance (Biology)

	NC objectives	Key questions	Key vocabulary
Reception			
KS1 Cycle A			
KS1 Cycle B			
LKS2 Cycle A			
LKS2 Cycle B			
UKS2 Cycle A			
UKS2 Cycle B	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p>	<p>Key questions</p> <p>What are living things made from? * Basics of how most living creatures are made of DNA that comes from two parents.</p> <p>What causes variation in species? * How variation is caused by either inheritance or adaptation. * Enquiry - identifying observable inherited characteristics in humans and dogs by looking at photographs of parents and offspring.</p>	<p>Animal, parent, offspring, gene, chromosome, DNA, cell, inherit, acquire, adapt, variation, environment, evolve, evolution, pioneer, fossil, finch, skeleton, purpose, survival, instinct</p>

Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

What is the difference between inherited and acquired characteristics?

* Identifying which characteristics come from genetics and which are environmental.

* Plotting a chart of inherited characteristics in the year group.

MATHS LINK (bar chart)

Who were the pioneers of evolution?

* Charles Darwin, Alfred Wallace, Mary Anning - notable discoveries and contribution to evolutionary science.

* Enquiry - What impact have Charles Darwin/Mary Anning/Alfred Wallace had on how we think about evolution?

How do animal species change over time?

* Introducing species adaptation over a long period of time.

* Enquiry - how do the shape of birds' beaks help them to survive? Darwin's finches experiment.

Do only animals adapt to survive?

* Enquiry - how have plants adapted to different climates and biomes?

Topic: Living things and Habitats (Biology)

	NC objectives	Key questions	Key vocabulary
Reception	<p>Children know about similarities and differences in relation to places, objects, materials and living things.</p> <p>They talk about the features of their own immediate environment and how environments might vary from one another.</p> <p>They make observations of animals and plants and explain why some things occur and talk about changes.</p>	<p><u>Key questions</u></p> <p>Where do polar bears live?</p> <p>* Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p>	<p>Natural, ice, animal, frozen, polar bear, penguins, arctic, antarctic, prey, predator, same, different, pattern, names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice</p>
KS1 Cycle A	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.</p>	<p><u>Key questions</u></p> <p>How do you know if something is living, dead or has never been alive?</p> <p>* Discuss MRS GREN and use as checklist in woods - basic description of each life process</p> <p>* Enquiry - Go to woods, identify/classify objects and things that are living, dead or have never been alive</p> <p>What habitats are there in the local area?</p> <p>* Exploring habitats and microhabitats (trip to Rising Sun Country Park)</p>	<p>Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed</p> <ul style="list-style-type: none"> • Names of local habitats e.g. pond, woodland etc. • Names of micro-habitats e.g. under logs, in bushes etc

	<p>Identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p> <p>Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)</p>	<p>Is there a difference in habitats around the world?</p> <ul style="list-style-type: none"> * Identify and locate different types of habitats around the world * Identify animals that live there, draw their habitat and describe how it helps them to survive * Enquiry - Research animals that live in different habitats and how their body is suited to their habitat <p>How do animals in a habitat depend on each other?</p> <ul style="list-style-type: none"> * Read Gruffalo and identify food chains within the story * Represent food chains through drama and represent how energy is transferred * Explore more food chains in different habitats and create their own * Make a food chain using the animals in the Gruffalo <p>How can we protect and sustain our farmland?</p>	
KS1 Cycle B			
LKS2 Cycle A			
LKS2 Cycle B	<p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)</p> <p>Farming and our local environment. The students will begin to look at why Belsay is so popular for farming and the advantages of this as well as farm safety and how this can impact the animals and farming environment.</p>	<p>Key questions</p> <p>What are the 7 life processes?</p> <ul style="list-style-type: none"> * Understanding how MRS GREN occurs in both animals and plants. Writing an information text. <p>What are the 5 groups of vertebrates?</p> <ul style="list-style-type: none"> * Characteristics of these groups. <p>How do we compare similarities and differences in vertebrates?</p> <ul style="list-style-type: none"> * Enquiry - Creating Carroll diagrams based on comparisons. <p>How do we create a simple classification key?</p> <ul style="list-style-type: none"> * Enquiry - Creating a key for 5 groups based on characteristics they've learnt. <p>What are invertebrates?</p> <ul style="list-style-type: none"> * Enquiry - Research the characteristics of insects, spiders and crustaceans - labeled diagrams <p>How do plants and animals in our local habitat change across the year?</p> <ul style="list-style-type: none"> * Enquiry - Research and be able to name plants and animals in the wider 	<p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p>

		<p>environment e.g. polar, desert, jungle, etc</p> <p>Are all animals with wings, flying birds? * Enquiry - identify patterns, similarities and differences between wings and flying in different animals</p>	
<p>UKS2 Cycle A</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p>	<p>Key questions</p> <p>How do plants reproduce? * Draw, name and label the parts of a plant including male and female organs * describe the process of pollination</p> <p>What is asexual reproduction? * Explain the difference between sexual and asexual reproduction in plants * What are the advantages and disadvantages of each? * Enquiry - Take plant cuttings and observe over time</p> <p>Do larger mammals have longer gestation periods? * Enquiry - compare animal size with gestation period.</p> <p>How do the life cycles of different species compare? * Enquiry - research life cycle of different mammals * compare and contrast life cycles of insects and amphibians * Enquiry - Classifying, grouping and sorting based on * create a slide presentation to compare life cycles</p>	<p>Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings</p>
<p>UKS2 Cycle B</p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. (Y6 - Evolution and inheritance)</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. (Y6 - Evolution and inheritance)</p>	<p>Key questions</p> <p>How are living things classified? * Recapping the classes of vertebrates and invertebrates and introducing echinoderms and annelids</p> <p>What are the characteristics of each classification? * Enquiry - Creating a classification key by choosing dividing questions based on animal classification. MATHS LINK</p> <p>Who was Karl Linnaeus and how did he classify creatures? * Understanding the scientific names of creatures and the steps to Linnaean classification</p> <p>What are microorganisms? * Learning about viruses, bacteria and fungi and when these can be helpful/harmful.</p> <p>What do microorganisms need to survive?</p>	<p>Animal, plant, mammal, bird, fish, reptile, amphibian, crustacean, mollusc, arachnid, insect, annelid, echinoderm, characteristic, classification, classification key, system, scientific name, genus, species, Latin, microorganism, mould, bacteria, fungi, virus</p>

		* Enquiry - designing and completing an experiment testing how mould grows on bread.	
--	--	--	--

Topic: Plants (Biology)

	NC objectives	Key questions	Key vocabulary
Reception			
KS1 Cycle A	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p><u>Key questions</u></p> <p>What are the different parts of a plant? * Identify, label and describe what each plant part does</p> <p>What are the similarities and differences between seeds and bulbs? * Enquiry - Identifying similarities and differences between seeds and bulbs * Labelling parts of a seed</p> <p>What do plants need to grow healthily? * Enquiry - what happens if we take away light or water? Observing what plants need to stay healthy.</p> <p>How does a plant change as it grows? * Identifying best times of year to plant seeds and bulbs * Enquiry - Plants a variety of seeds and bulbs and observe changes as they grow</p>	<p>light, shade, sun, warm, cool, water, grow, healthy, leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area</p>

		<p>Does it matter which way round a seed or a bulb it planted? *Enquiry - Plant seeds/bulbs in CD case and observe growth of roots and stem.</p>	
KS1 Cycle B	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>Key questions Which plants grow in my environment? *Children to take pictures at home and look in forest.</p> <p>What are deciduous and evergreen trees? *Enquiry - Group trees from their local area into these two groups. *Observe at different times of the year as evidence.</p> <p>What is the basic structure of a plant and a tree? *Pick apart different flowers/plants and identify basic structure.</p> <p>Do bigger plants have bigger leaves? *Enquiry - Compare plants in local environment to leaf size.</p>	<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area</p>
LKS2 Cycle A	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>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.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Key questions How do the parts of a plant help to keep it alive? * Understand that some but not all plants have roots, trunk/stem, leaves and flower * Enquiry - What happens if we take away one of the major structures of a plant?</p> <p>What do plants need to grow well? * Exploring different conditions in plants around the world and understanding their needs..</p> <p>How is water transported through a plant? * Enquiry - Celery experiment to explore movement of water through a stem.</p> <p>Why do some plants have flowers? * Observe where pollen can be found on plants, identify pollinators and recognise the pollination cycle (life cycle of a flowering plant).</p> <p>How do seeds disperse? * Identify different the purpose of and different methods of seed dispersal. * Enquiry - groups trees with different seed dispersal</p>	<p>Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)</p>
LKS2 Cycle B			
UKS2 Cycle			

A			
UKS2 Cycle B			

Topic: Rocks (Chemistry)

	NC objectives	Key questions	Key vocabulary
Reception			
KS1 Cycle A			
KS1 Cycle B			
LKS2 Cycle A	<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<p>Key Questions</p> <p>What are rocks and where do they come from? * Look at the rock cycle and rock groups.</p> <p>What are the properties of rocks? * Enquiry - Look at different rock samples and their features - size, texture, testing permeability - classify based on these</p> <p>What is erosion? * Look at what erosion means and the types of erosion - Wind, water,</p>	<p>Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil</p>

		<p>humans, glaciers.</p> <p>What are fossils? * Enquiry - Look at the process of fossil formation</p> <p>Which soils are most permeable? * Enquiry - Testing soils through water for permeability * Particles of soil diagram.</p>	
LKS2 Cycle B			
UKS2 Cycle A			
UKS2 Cycle B			

Topic: States of Matter (Chemistry)

	NC objectives	Key questions	Key vocabulary
Reception	<p>Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.</p>	<p>Key questions How does water change? How can ice turn into water? How does water disappear? How does the cake mixture change? * Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p>Mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change</p>

			back,
KS1 Cycle A	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>Key questions What is a material? * Identifying different types of materials and naming their properties</p> <p>What materials are most common in our everyday environment and why? * Tally chart of materials in school, create block graph MATHS LINK (tally chart)</p> <p>Which materials can be changed by force? * Investigate using different force on materials and recording how they change.</p> <p>What material would be best to make...? * Enquiry - Investigate different materials to test if they are absorbant</p> <p>How are materials suited to their purpose? * Considering what would happen if objects were made from different materials. E.g. What if door handles were made from chocolate.</p>	<p>Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, nonreflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p>
KS1 Cycle B	<p>Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Key questions What material are different objects made from? * Distinguish between an object and the material from which it is made.</p> <p>What different materials are there? * Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock * Enquiry - sort objects based on these</p> <p>What are the simple properties of materials? * Describe the simple physical properties of a variety of everyday materials.</p> <p>Which material is the most waterproof? * Enquiry - comparative/fair testing different materials to make an umbrella.</p> <p>How can we group materials by their properties? * Enquiry - Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p>
LKS2 Cycle A			

<p>LKS2 Cycle B</p>	<p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>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).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)</p>	<p>Key questions</p> <p>What are solids, liquids and gases? * Particle movement and behaviour. Acting out particle movement.</p> <p>How do solids vary? * Enquiry - classifying solids, liquids and gases based on their properties</p> <p>What affects the speed of evaporation? * Enquiry - into evaporation in different conditions.</p> <p>How does solid turn to a liquid? * Enquiry - how does ice melt over time MATHS LINK (reading thermometer and recording results)</p> <p>At what temperature do materials change state? * Enquiry - research the temperatures at which different solids melt.</p> <p>What is the water cycle? * Naming steps of water cycle and writing an explanation text</p>	<p>Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p>
<p>UKS2 Cycle A</p>	<p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>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</p>	<p>Key questions</p> <p>Why are different materials chosen for different jobs? *Identifying materials and their properties *Enquiry - Classifying, grouping and sorting based on how materials have different uses depending on their properties and state (liquid, solid, gas). *Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets.</p> <p>Are these solids dissolving or disappearing? *To know that some materials will dissolve in liquid to form a solution by investigating dissolving. *Compare and group together everyday materials on the basis of their solubility by investigating dissolving. * Enquiry - Investigate rates of dissolving by carrying out comparative and fair test.</p> <p>What is the difference between a conductor and an insulator? * Enquiry - which food defrosts firsts - on wood or metal? * To compare and group together everyday materials on the basis of their thermal conductivity by investigating thermal conductors and insulators.</p> <p>How can these mixtures be separated?</p>	<p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p>

	burning and the action of acid on bicarbonate of soda.	<p>*Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture.</p> <p>*use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving</p> <p>Are these changes reversible?</p> <p>*Enquiry - Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning.</p> <p>*Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?</p> <p>*Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton).</p>	
UKS2 Cycle B			

Topic: Earth and Space (Physics)

	NC curriculum	Key questions	Key vocabulary
Reception			
KS1 Cycle A			
KS1 Cycle B	Observe changes across the four seasons. (Y1 - Seasonal changes) • Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)	<p>Key questions</p> <p>What is the solar system?</p> <p>*Enquiry - Explore texts to investigate what we might find in space (planets, stars, moons, steroids etc)</p> <p>What are the parts of the solar system and the planets?</p> <p>*Explore the order of planets and discuss their distance from each other and the sun.</p>	Sun, moon, Earth, planet, orbit, rotate, axis, core, Mars, Venus, Mercury, Jupiter, Saturn, Uranus, Neptune, Pluto, solar system, the milky way, stars

		<p>What is the job of the sun?</p> <ul style="list-style-type: none"> *Explore day and night *Enquiry - Link to seasonal change (another topic covered during the year) <p>What are the characteristics of the moon and planets?</p> <ul style="list-style-type: none"> *Discuss the planet's properties in brief detail - e.g. order, moons. 	
LKS2 Cycle A			
LKS2 Cycle B			
UKS2 Cycle A	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	<p>Key questions</p> <p>Is the Earth spherical?</p> <ul style="list-style-type: none"> *explore evidence which suggests the earth is spherical/flat *explain why we know the Sun, Earth and Moon are spherical <p>Are the planets in our solar system similar?</p> <ul style="list-style-type: none"> * name and describe features of the planets in our solar system. * order the planets in our solar system. * Enquiry - research, using chromebooks to create planet fact files * Enquiry - Classifying, grouping and sorting planets based on similarities and differences <p>How do the planets in our solar system move?</p> <ul style="list-style-type: none"> *Explore geocentric vs heliocentric theories *Enquiry - research how theories have changed over time *explain how planets move in our solar system. <p>Why do we have night and day?</p> <ul style="list-style-type: none"> *make predictions about night and day in different places on Earth. *support the idea that different places on Earth experience night and day at different times with evidence. *explain why night and day occur at different times in different places on Earth. <p>Why are there different time zones around the world?</p> <ul style="list-style-type: none"> *explain that the Moon orbits the Earth not the Sun. through practical models *explain how the Moon moves relative to the Earth. 	<p>Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets</p>

		<p>*name the 8 phases of the moon and create a diagram to show this</p> <p>How many phases are there in the cycle of the moon?</p> <p>*explain that the Moon orbits the Earth not the Sun and how the moon moves relative to the earth.</p> <p>* explore how the Earth and Moon move relative to the Sun</p> <p>* name the 8 phases of the moon</p>	
UKS2 Cycle B			

Topic: Electricity (Physics)

	NC objectives	Key questions	Key vocabulary
Reception			
KS1 Cycle A			
KS1 Cycle B			
LKS2 Cycle A			

<p>LKS2 Cycle B</p>	<p>Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>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.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>Key questions</p> <p>What is power used for? * Identifying appliances and where power comes from * Enquiry - sorting appliances into battery and mains power</p> <p>What is a complete simple circuit? * Build a simple series circuit with wires, battery, bulb, buzzer, motor. * Drawing this with pictures - not yet symbols * Enquiry - What are the effects of adding more components to a simple series circuit?</p> <p>What makes a circuit complete? * Making given circuits and predicting/testing to find whether they are complete or not.</p> <p>Which materials could we use as a conductor? * Enquiry - investigating different materials to group as conductors or insulators.</p> <p>What is a switch? * Looking at examples of switches and making a switch. * Using their switch in a circuit.</p>	<p>Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol</p>
<p>UKS2 Cycle A</p>			
<p>UKS2 Cycle B</p>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Key questions</p> <p>How does electricity work? * Understanding what electricity is (flow of electrons) and how it works on an atomic level.</p> <p>Who are the pioneers of electricity? * Enquiry - Research and discuss important individuals who've made a contribution to electrical innovations. Look at AC/DC currents (Tesla vs Edison) and how they differ.</p> <p>How are circuits built? * Look at scientific symbols for circuits and how to build a simple and parallel circuit alongside accurate scientific diagrams.</p> <p>How do we know if a circuit works? * Build and alter circuits to ensure they work, identifying faulty components and how to troubleshoot this. Practical - no evidence in</p>	<p>Electron, proton, neutron, atom, electricity, static, current, mains, battery, cell, load component, closed circuit, open circuit, pioneer, AC (alternating current), DC (direct current), power, voltage, watts, insulator, conductor.</p>

		<p>books.</p> <p>How is electricity generated? * Enquiry - Identify the different ways electricity is generated (renewable and non-renewable) and how homes are powered by mains.</p> <p>How can electricity be used practically? * Enquiry - Build a physical model that uses a circuit to light up/buzz/move using knowledge of electricity and circuits. DT - Lighthouse project.</p>	
--	--	--	--

Topic: Forces (Physics)

	NC objectives	Key questions	Key vocabulary
Reception			
KS1 Cycle A			
KS1 Cycle B			
LKS2 Cycle	Compare how things move on different surfaces. • Notice that	<u>Key Questions</u>	Force, push, pull, twist,

<p>A</p>	<p>some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing</p>	<p>What is a force? * Recognise that forces are push and pull motions. * Recognise different push and pulls around the school</p> <p>Will two north poles attract? * At the end recognise the poles of a magnet and when they will attract and repel by using magnets to explore.</p> <p>Which materials are magnetic? * Enquiry - sorting objects into magnetic or not magnetic/both - depending using a magnet to test this.</p> <p>Do all magnets attract objects from the same distance? * Enquiry - Investigating magnet strength.</p> <p>How do surfaces change the way an object moves? * Enquiry - Investigate the movement of an object across different surfaces and measure distance travelled by toy car as friction. MATHS LINK (measuring distance travelled)</p>	<p>contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole</p>
<p>LKS2 Cycle B</p>			
<p>UKS2 Cycle A</p>	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	<p>Key Questions</p> <p>What is a force? * Recap forces and identify them around them</p> <p>What force is needed to move an object across different surfaces? * look at the difference between weight and mass and discuss gravity * Enquiry - Use newton meters to measure force of gravity on objects of different mass MATHS LINK (measuring using Newton metre)</p> <p>When can friction be useful? * Enquiry - Identifying high/low friction and whether it is useful</p> <p>What is air resistance? * Designing and testing a rocket that can travel most easily with least air resistance</p>	<p>Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears</p>

		<p>Do heavier items have more water resistance?</p> <ul style="list-style-type: none"> * Identify what water resistance is and identify positives and negatives * Enquiry - experiment with different shapes of plasticine to the time taken to travel through water. 	
UKS2 Cycle B			

Topic: Light (Physics)

	NC objectives	Key questions	Key vocabulary
Reception			
KS1 Cycle A			
KS1 Cycle B			

<p>LKS2 Cycle A</p>	<p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p>	<p>Key Questions</p> <p>What is light and dark?</p> <ul style="list-style-type: none"> * Looking at different light sources (man made and natural) and what happens when there is no light (grouping activities) * Enquiry - grouping sources of light and non-sources of light as well as man made or natural. <p>How do we see?</p> <ul style="list-style-type: none"> * Looking at how light travels in straight lines and reflects from the object to the eye. (Investigate with torches and talc) <p>How can we be safe with light?</p> <ul style="list-style-type: none"> * Identifying the risks from sunlight (burns, eyesight, cancer ets) * Consider the ways in which we can stay safe - make a safety poster. <p>What are reflective surfaces?</p> <ul style="list-style-type: none"> * Identify the dangers of seeing at night - use of reflective materials for signs and clothing. Investigate materials in the room that are reflective - are there similarities in the properties of reflective materials? <p>Enquiry - which material is the most reflective?</p> <p>What is refraction?</p> <ul style="list-style-type: none"> * Explore how light travels in straight lines but can reflect from materials. Identify what happens to white light when it splits by using prisms and how refraction changes the way we see light and objects. <p>How are shadows formed?</p> <ul style="list-style-type: none"> * Explore the meanings of opaque translucent and transparent. Recognise how certain objects block the path of light while others allow some or all light to pass through. Investigate Opaque, Translucent and Transparent objects in the room. <p>Enquiry - testing and sorting objects into opaque and transparent</p> <p>Enquiry - Testing what happens to shadows when the light moves further or closer to an object</p> <p>MATHS LINK (no official measuring but size change when moved closer/further away)</p> <p>*Enquiry - how do shadows change throughout the day?</p>	<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p>
<p>LKS2 Cycle B</p>			

UKS2 Cycle A			
UKS2 Cycle B	<p>Recognise that light appears to travel in straight lines.</p> <p>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.</p> <p>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.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>	<p>Key Questions</p> <p>What do I know about light? * Exploring natural and artificial light, where light comes from, how it travels and the electromagnetic spectrum.</p> <p>How does light allow us to see? * Look in detail how light travels from a light source and reflects off objects into the human eye * name and identify parts of the human eye.</p> <p>Can the path of light be altered? * Enquiry - Focus on refraction and set up experiments to prove how light travels slower through different mediums. * Investigate how periscopes work and the effect mirrors have on light travel. MATHS LINK (angles)</p> <p>What colour are shadows? * Enquiry - Investigate how shadows are formed and how they change depending on the angle/distance of the light source. MATHS LINK (measuring size and distance)</p>	<p>Natural, artificial, light source, rays, electromagnetic spectrum, x-ray, gamma ray, infrared, microwave, radio wave, vision, opaque, transparent, translucent, incidence, reflect, refract, spectrum, iris, pupil, cornea, lens, optic nerve, retina.</p>

Topic: Seasonal Changes (Physics)

	NC objectives	Key questions	Key vocabulary
Reception	<p>Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.</p>	<p>Key questions</p> <p>How do the seasons make our forest change? * Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p>Spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants,</p>

			flowers, hibernate, migrate, snowflake, nocturnal.
KS1 Cycle A			
KS1 Cycle B	<p>Observe changes across the four seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>	<p>Key questions</p> <p>What changes occur during the four seasons?</p> <p>* Enquiry - Observe changes across the four seasons.</p> <p>Maths link - created charts to show seasonal changes</p> <p>What types of weather are associated with the four seasons?</p> <p>* Observe and describe weather associated with the seasons</p> <p>Are all days in the summer sunny? Are all days in the winter cold?</p> <p>* Enquiry - Observe weather throughout months</p>	<p>Weather (sunny, rainy, windy, snowy etc.)</p> <p>Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length</p>
LKS2 Cycle A			
LKS2 Cycle B			
UKS2 Cycle A			
UKS2 Cycle B			

Topic: Sound (Physics)

	NC objectives	Key questions	Key vocabulary
Reception			

KS1 Cycle A			
KS1 Cycle B			
LKS2 Cycle A			
LKS2 Cycle B	<p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>	<p>Key questions</p> <p>How is sound created?</p> <p>* Understanding vibrations and what happens to the particles in the air.</p> <p>How does our ear work?</p> <p>* Parts of the ear labelled diagram and how these link with vibrations.</p> <p>* Presenting learning as a video.</p> <p>Does being further away from the source always mean it's quieter?</p> <p>* Enquiry - Use a decimeter to measure sounds further to and closer away from an object</p> <p>MATHS LINK (reading decimeter and recording)</p> <p>What are the patterns in pitch and vibration in different sources?</p> <p>* Exploring differences in pitch and volume in different materials and objects.</p> <p>Which material is best for soundproofing?</p> <p>* Enquiry - Investigating change in volume using different materials and soundproofing.</p>	<p>Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p>
UKS2 Cycle A			
UKS2 Cycle B			