Science Curriculum Overview Schools Designed:

EYFS					
Theme:	**EYFS Framework objectives covered:**	**Working Scientifically Skills progression – bold denotes core skills:**	**Knowledge – bold denotes core knowledge**	**Core vocabulary**	**Scientific Investigation**
Exploration and Curiosity	Explore the natural world around them.	Explore the natural world around them. Explore and talk about different forces they can feel. Plant seeds and care for growing plants. Use all their senses in hands on exploration of natural materials. Begin to understand the need to respect and care for the natural environment and all living things. Ask questions about things they can see.	Know what their senses are. Know features of the environment. Know what a seed is and what it needs to grow. Names of natural materials. What a question is. Why it is important to care for the environment and living things.	Senses, trees, grass, flowers, sky clouds, weather, explore, question, wood, metal, sand, water, stone, bark, soil, grow, light, seed.	
Similarities and differences	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.	Explore collections of materials with similar/ or different properties. Recognising that some environments are different to the one in which they live. Talk about the differences between materials and changes they notice.	What the same and differences are. Language to describe things they see and observe. What an environment/habitat is. What is a material is.	Same, different, material, environment, habitat.	
Observations	Making observations and drawing pictures of animals and plants. Understanding processes and change in the natural world around them.	Understand the effects of changing seasons on the natural world around them. Understanding the key features of the life cycle of plants and animals. Talk about what they see using wide vocabulary. Describe what they can see hear and feel whilst outside.	The basic features of a season. Knowing what a life cycle is. Weather conditions.	Spring, summer, autumn, winter, season, life cycle, plant, flowers, vegetables, changed, sunny, rain, wind, cold, hot, snow, fog, ice, alive, dead.	
Managing self	Manage their own basic hygiene and personal needs including dressing, going to the toilet, and understanding the importance of healthy food choices.	Understand the importance of keeping their hands clean. Know and talk about the factors that support their overall health and well being. The importance of regular exercise, brushing of teeth, sensible amounts of screen time, having a good sleep routine and being a safe pedestrian.	Know to go to the toilet independently. Know how to wash their hands and spreading germs. How to move safely around obstacles. What some healthy food choices are. The importance of brushing their teeth. Some of the reason why it is important to get a good night sleep.	Soap, clean, germs, safely, healthy, toothbrush, toothpaste, brush.	

Science Curriculum Overview Schools Designed:

Year 1					
Theme:	**NC objectives covered:**	**Working Scientifically Skills progression – bold denotes core skills:**	**Knowledge – bold denotes core knowledge**	**Core vocabulary**	**Scientific Investigation**
Working Scientifically	Asking simple questions and recognising that they can be answered in different ways. Observing closely, using simple equipment. Performing simple tests. Identifying and classifying. Using their observations and ideas to suggest answers to questions. Gathering and recording data to help in answering questions.	• Can I observe how this changes over time? • Can I see if there are any patterns in my experiment? • Can I try grouping and classifying objects according to their similarities and differences? • Can I try comparing different ways of testing? • Can I try looking in a book or online for more information?	Explore the world around them and raise their own simple questions. Experience different types of science enquiries, including practical activities. Begin to recognise different ways in which they might answer scientific questions. Carry out simple tests. Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying). Ask people questions and use simple secondary sources to find answers. Observe closely using simple equipment. With help, observe changes over time. With guidance, they should begin to notice patterns and relationships. Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data. Record simple data. Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language.	Question, how, what, where, when, why, who, magnifying glass, microscope, test, group, answer, equipment, results, sort, explore, observe, similar, similarities, collect, measure, record, compare, describe, different, differences.	Use Explorify to encourage scientific questioning at the beginning of lessons. The odd-one-out, zoom-in zoom-out and video activities are particularly good for encouraging questions. Ask children to consistently use “because” to justify their ideas. Encourage children to make links to other areas of science and previous learning.

Science Curriculum Overview Schools Designed:

Plants	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees.	• Can I identify and name a variety of plants? • Can I identify and describe the basic structure of plants and trees?	Make close observations of leaves, seeds, flowers etc. • Compare two leaves, seeds, flowers etc. • Classify leaves, seeds, flowers etc. using a range of characteristics. • Identify plants by matching them to named images. • Make observations of how plants change over a period of time. • When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them.	Plant, green, oak, ash, chestnut, rowan, beech, birch, conifer, pine, daffodil, tulip, daisy, deciduous, evergreen, blossom, grass, tree, bush, vegetable, fruit, Stem, leaf, root, stalk, trunk, branch, flower, fruit, petals, bulb, seed	
Animals including humans	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	• Can I classify a range of animals by amphibian, reptile, mammal, fish and birds? • Can I classify animals by what they eat (carnivore, herbivore and omnivore)? • Can I sort by living and non living things?	Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body.	Fish, reptiles, mammals, birds, amphibians, herbivore, omnivore, carnivore, Salmon, cod, shark, trout, lizard, gecko, snake, human, fox, badger, lion, elephant, whale, dolphin, chimpanzee, eagle, robin, blue tit, sparrow, pidgeon, seagull, frog, newt, toad, Leg, arm, elbow, head, ear, nose, back, wings, beak, wings, back	
Everyday materials	Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.	• Can I name the materials an object is made from?	All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can	Wood, plastic, glass, paper, water, metal, rock, hard, soft, bendy, rough, smooth	

	Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties. Distinguish between an object and the material from which it is made	• Can I talk about the properties of everyday materials?	be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties.		
Seasonal changes	Observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies.	• Can I name the seasons and know about the type of weather in each season	In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.	Summer, Spring, Autumn, Winter, Sun, Day, moon, night, light, dark	

Year 2					
Theme:	**NC objectives covered:**	**Working Scientifically Skills progression – bold denotes core skills:**	**Knowledge – bold denotes core knowledge**	**Core vocabulary**	**Scientific Investigation**
Working Scientifically	Asking simple questions and recognising that they can be answered in different ways Observing closely, using simple equipment Performing simple tests Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions.	• Can I observe how this changes over time? • Can I see if there are any patterns in my experiment? • Can I try grouping and classifying objects according to their similarities and differences? • Can I try comparing different ways of testing? • Can I try looking in a book or online for more information?	Explore the world around them and raise their own simple questions. Experience different types of science enquiries, including practical activities. Begin to recognise different ways in which they might answer scientific questions. Carry out simple tests. Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying). Ask people questions and use simple secondary sources to find answers. Observe closely using simple equipment. With help, observe changes over time. With guidance, they should begin to notice patterns and relationships. Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data. Record simple data. Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of	Chart, table, pictogram, tally chart, block diagram, graph, gather, order, notice patterns, link ideas, stopwatch, pipette, syringe, use, comparatives, hotter/cooler, older/younger.	

			ways and begin to use simple scientific language.		
Living things and their habitats	Explore and compare the differences between things that are living, dead, and things that have never been alive 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 Identify and name a variety of plants and animals in their habitats, including microhabitats 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.	Can I classify things by living, dead or never lived? Can I know how a specific habitat provides for the basic needs of things living there (plants and animals)? Can I match living things to their habitat? Can I name some different sources of food for animals? Can I know about and explain a simple food chain?	All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.) An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels). Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water. Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain	Living, dead, habitat, energy, food chain, predator, prey, woodland, pond, desert, sea, polar, forest, grassland/tundra, producer, consumer, breathe, needs, shelter, heat, carnivore, herbivore, adaptations, omnivore, pond, woodland.	

			their food from plants and other animals can be shown in a food chain.		
Plants	Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Can I know and explain how seeds and bulbs grow into plants? Can I know what plants need in order to grow and stay healthy (water, light and suitable temperature)?	Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.	Seeds, bulbs, water, light, temperature, growth, plant, germinate, soil, seedling, shoot, fully grown, growth, healthy, wither, earth, hot/cold, nutrients.	
Animals including humans	Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Can I know the basic stages in a life cycle for animals, (including humans)? Can I know why exercise, a balanced diet and good hygiene are important for humans?	Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and	Survival, water, air, food, adult, baby, offspring, kitten, calf, puppy, exercise, hygiene, healthy, unhealthy, shelter, life-cycle,, adult, young, baby, toddler, teenager, basic needs, water, food, air, hygiene, infection, exercise, unhealthy.	

			types of food and exercise. Good hygiene is also important in preventing infections and illnesses.		
Use of everyday materials	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Can I know how materials can be changed by squashing, bending, twisting and stretching? Can I know why a material might or might not be used for a specific job?	All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.	Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, absorbent, opaque, transparent, translucent, brick, paper, fabric, squashing, bending, twisting, stretching, elastic, foil, manmade, natural, describe, change, pushing, pulling, suitable, characteristics, properties, rigid, flexible, strong, weak, reflective, non reflective, transparent, opaque, translucent, shape, changes.	

Science Curriculum Overview Schools Designed:

Year 3					
Working Scientifically Core Vocabulary LKS2 (Y3/4) Prediction, conclusion, criteria, classify, changes, data, contrast, evidence, improve, secondary sources, guides, keys, construct, interpret **Research**: relevant question **Equipment**: thermometer, data logger **Data**: gather, standard units, record, classify, present **Record**: diagram (labelled), keys, bar charts, tables					
Theme:	**NC objectives covered:**	**Skills progression – bold denotes core skills:**	**Knowledge – bold denotes core knowledge**	**Core vocabulary**	**Scientific Investigation**
Plants	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 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 investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	• Can I identify and describe the functions of different parts of flowering plants (roots, stem/trunk, leaves and flowers)? • Can I explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)? • Can I explain how they vary from plant to plant? • Can I investigate the way in which water is transported within plants? • Can I explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal? • *Can I classify a range of common plats according to many criteria (environment found, size, climate required, etc.)?*	Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.	Growth, germinate, light, reproduce, part, role, temperature, absorb, soil, well-drained, fertiliser, nutrients, plant lifecycle, transported, pollination, seed formation, seed dispersal, structure, function, plant tissues, pores competition for resources	Observe what happens to plants over time when the leaves or roots are removed. Observe the effect of putting cut white carnations or celery in coloured water. Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space. Spot flowers, seeds, berries and fruits outside throughout the year. Observe flowers carefully to identify the pollen. Observe flowers being visited by pollinators e.g. bees and butterflies in the summer. Observe seeds being blown from the trees e.g. sycamore seeds. Research different types of seed dispersal. Classify seeds in a range of ways, including by how they are dispersed. Create a new species of flowering plant.
Animals, including humans	identify that animals, including humans, need the right types and amount of nutrition, and that	• Can I explain the importance of a nutritionally balanced diet? • Can I describe how nutrients, water and oxygen are transported within animals and humans?	Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients –carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water–and fibre that are needed by the body to stay healthy. A	Skeleton, skull, bones, muscles, movement, support, protection, nutrition, balanced diet, vitamins, fibre,	Classify food in a range of ways. Use food labels to explore the nutritional content of a range of food items. Use secondary sources to find out the types of food that contain the different nutrients.

	they cannot make their own food; they get nutrition from what they eat identify that humans and some other animals have skeletons and muscles for support, protection and movement	• Can I identify that animals, including humans, cannot make their own food: they get nutrition from what they eat? • *Can I explain how certain living things depend on one another to survive?* • Can I describe and explain the skeletal system of a human? • Can I describe and explain the muscular system of a human? • *Can I explain how the muscular and skeletal systems work together to create movement?* • *Can I explain how people, weather and the environment can affect living things?* • *Can I classify living things and non-living things by a number of characteristics that they have thought of?*	piece of food will often provide a range of nutrients. Humans,and some other animals,have skeletons and muscles which help them move and provide protection and support.	carbohydrate, protein, minerals, fat, brain, blood vessels, heart, skull, ribs spine, backbone, joints, sockets, bones, tendons	Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? Plan a daily diet to contain a good balance of nutrients. Explore the nutrients contained in fast food. Use secondary sources to research the parts and functions of the skeleton Investigate patterns asking questions such as: Can people with longer legs run faster? Can people with bigger hands catch a ball better? Compare, contrast and classify skeletons of different animals.
Rocks	compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter	• Can I compare and group together different rocks on the basis of their appearance and simple physical properties? • Can I describe and explain how different rocks can be useful to us? • Can I describe and explain the differences between sedimentary and igneous rock considering the way they are formed? • Can I describe in simple terms how fossils are formed when things that have loved are trapped in a rock? • Can I recognise that soils are made from rocks and organic matter? • *Can I classify igneous and sedimentary rocks?* • *Can I relate properties of rocks with their uses?*	Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.	Rock, stone, pebble, boulder, absorb water, let water through, soil, fossil, grains, crystals, layers, texture, molten magma, Name properties of such as hard, soft, name common rocks/soil types, marble, chalk, clay, sandy	Observe rocks closely. Classify rocks in a range of ways, based on their appearance. Devise a test to investigate the hardness of a range of rocks. Devise a test to investigate how much water different rocks absorb. Observe how rocks change over time e.g. gravestones or old building. Research using secondary sources how fossils are formed. Observe soils closely. Classify soils in a range of ways based on their appearance. Devise a test to investigate the water retention of soils. Observe how soil can be separated through sedimentation. Research the work of Mary Anning.
Light	recognise that they need light in order to see things and that dark is the absence of light	• Can I recognise that we need light in order to see things? • Can I recognise that dark is the absence of light?	We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example,the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more	Light Light source Names of light sources, torch etc Dark / darkness Reflect	Explore how different objects are more or less visible in different levels of lighting. Explore how objects with different surfaces,e.g. shiny vs matt, are more or less visible.

	notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change.	• Can I notice that light is reflected from surfaces? • Can I recognise that light from the sun can be dangerous and that there are ways to protect my eyes? • Can I recognise that shadows are formed when light from a light source is blocked by a solid object? • Can I find patterns in a way that size of shadows change? • Can I explain why light needs to be bright or dimmer according to need? • *Can I explain the difference between transparent, translucent and opaque?* • *Can I explain why my shadow changes when the light source is moved closer or further from the object?*	light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective.The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light.Shadows are formed on asurface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface.	Reflective Mirror Shadow Block / absorb Direction of light Transparent Opaque Translucent Bright Dim Light beam sunlight	Explore how shadows vary as the distance between a light source and an objector surface is changed. Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground. Choose suitable materials to make shadow puppets. Create artwork using shadows.
Forces and Magnets	compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others 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	• Can I compare how things move on different surfaces? • Can I observe that magnetic forces can be transmitted without direct contact? • Can I observe how magnets attract and repel each other? • Can I classify which materials are attracted to magnets and which are not? • Can I notice that some forces need contact between two objects so magnetic forces can act at a distance? • Can I compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet? • Can I identify some magnetic materials? • Can I describe magnets having two poles? (N and S) • Can I predict whether two magnets will attract or repel each other depending on which poles are facing? • *Can I investigate strengths of different magnets and find fair ways to compare them?*	A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes.A magnet attracts magnetic material. Iron and nickel and other materials containing these,e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles –a north pole and a south pole. If two like poles,e.g. two north poles, are brought together they will push away from each other –repel. If two unlike poles,e.g. a north and south, are brought together they will pull together –attract.	Force gravity Push / pull Direction of force Air resistance streamlined Float / sink Friction Force-meter Magnet Magnetic force Strength Attract Repel Poles North pole South pole Bar magnet Ring magnet Button magnet Horse-shoe magnet Name common magnetic and non-magnetic materials	Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. Explore what materials are attracted to a magnet. Classify materials according to whether they are magnetic. Explore the way that magnets behave in relation to each other. Use a marked magnet to find the unmarked poles on other types of magnets. Explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table. Devise an investigation to test the strength of magnets.

	describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing				

Year 4
Working Scientifically Core Vocabulary LKS2 (Y3/4)
Prediction, conclusion, criteria, classify, changes, data, contrast, evidence, improve, secondary sources, guides, keys, construct, interpret
Research: relevant question, fair test
Equipment: thermometer, data logger, microscope, petri dish, safety goggles
Data: gather, standard units, record, classify, present
Record: diagram (labelled), keys, bar charts, tables

Theme:	**NC objectives covered:**	**Skills progression – bold denotes core skills:**	**Knowledge – bold denotes core knowledge**	**Core vocabulary**	**Scientific Investigation**
Living things and their habitats	recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that environments can change and that this can sometimes pose dangers to living things	• *Can I classify living things and non-living things by a number of characteristics?* • *Can I explain how people, weather and the environment can affect living things?* • *Can I explain how certain living things depend on one another to survive?*	Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.Living things live in a habitat which provides an environment to which they are suited (Year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way(i.e. positive human impact, such as setting up nature reserves)or in a bad way (i.e. negative human impact, such as littering). These environments also change with the seasons; different living things can be found in a habitat at different times of the year.	Classification keys Environment Fish Reptiles Amphibians Mammals Birds Vertebrates Invertebrates Human impact Plant groups (trees, grasses, flowering and non-flowering plants) Name some common invertebrates	Observe plants and animals in different habitats throughout the year. Compare and contrast the living things observed. Use classification keys to name unknown living things. Classify living things found in different habitats based on their features. Create a simple identification key based on observable features. Use fieldwork to explore human impact on the local environment e.g. litter, tree planting. Use secondary sources to find out about how environments may naturally change. Use secondary sources to find out about human impact, both positive and negative, on environments
Animals, including Humans	describe the simple functions of the basic	• Can they identify and name the basic parts of the digestive system in humans?	Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the	Digestive system digestion Saliva	Research the function of the parts of the digestive system. Create a model of the digestive system using household objects.

	parts of the digestive system in humans identify the different types of teeth in humans and their simple functions construct and interpret a variety of food chains, identifying producers, predators and prey	• Can they describe the simple functions of the basic parts of the digestive system in humans? • Can they identify the simple function of different types of teeth in humans? • Can they compare the teeth of herbivores and carnivores? • Can they explain what a simple food chain shows? • Can they construct and interpret a variety of food chains, identifying producers, predators and prey?	oesophagus to the stomach. Here the food isbroken down further by being churned around and other chemicals are added.The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passesinto the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. Humans have four types of teeth:incisors for cutting;canines for tearing;and molars and premolars for grinding (chewing).	Oesophagus Stomach Small intestine Large intestine Absorb into blood stream Swallowing Chewing Rectum Anus Faeces Consumer Predator Prey Producers Canines Incisors Pre-molars Molars Cavities Dentine Plaque Pulp-cavity Fluoride Tooth decay Gums Nerves Enamel	Explore eating different types of food to identify which teeth are being used for cutting, tearing and grinding (chewing). Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls. Use food chains to identify producers, predators and prey within a habitat. Use secondary sources to identify animals in a habitat and find out what they eat.
States of Matter	compare and group materials together, according to whether they are solids, liquids or gases 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)	• Can I compare and group materials together, according to whether they are solids, liquids of gases? • Can I explain what happens to materials when they are heated or cooled? • Can I measure or research the temperature at which different materials change state in degrees Celsius? • Can I use measurements to explain changes to the state of water? • Can I identify the part that evaporation and condensation has in the water cycle?	A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is $0^{o}C$. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils	Air/Oxygen Powder Grain/ granular Changes state Gaseous Water vapour Water cycle Heating /cooling Degree Celsius Melt/Freeze Boil Particles Evaporation	Observe closely and classify a range of solids. Observe closely and classify a range of liquids. Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind. Classify materials according to whether they are solids, liquids and gases. Observe a range of materials melting e.g. ice, chocolate, butter. Investigate how to melt ice more quickly. Observe the changes when making rocky road cakes or ice-cream.

	identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	• Can I associate the rate of evaporation with temperature? • *Can I group and classify a variety of materials according to the impact of the temperature on them?* • *Can I explain what happens over time to materials such as puddles on the playground or washing hanging on a line?* • *Can I relate temperature to change of state of materials?*	when it is heated to 100$_{o}$C. Evaporation is the same state change as boiling (liquid to gas),but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed,the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain backinto rivers etc. This is known as precipitation. This is the water cycle.	Condensation Energy transfer	Investigate the melting point of different materials e.g. ice, margarine, butter and chocolate. Explore freezing different liquids e.g. tomato ketchup, oil, shampoo. Use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration). Observe water evaporating and condensing e.g. on cups of icy water and hot water. Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers. Use secondary sources to find out about the water cycle.
Sound	identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases.	• Can I describe a range of sounds and explain how they are made? • Can I associate some sounds with something vibrating? • Can I compare sources of sound and explain how the sounds differ? • Can I explain how to change a sound (louder/softer)? • Can I recognise how vibrations from sound travel through a medium to an ear? • Can I find patterns between the pitch of a sound and features of the object that produce it? • Can I find patterns between the volume of the sound and the strength of the vibrations that has produced it? • Can I recognise that sounds get fainter as the distance from the sound source increases? • Can I explain how you could change the pitch of a sound? • Can I investigate how different materials can affect the pitch and volume of sounds? • *Can I explain why sound gets fainter or louder according to the distance?* • *Can I explain how pitch and volume can be changed in a variety of ways?*	A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound,but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively.Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.	Sound Sound source Noise Vibrate / vibration Travel Sound wave Pitch Volume Loud / quiet Tune High / low Echo Tuning fork Insulation Instrument Percussion String/Brass Woodwind Tunes instrument	Classify sound sources. Explore making sounds with a range of objects, such as musical instruments and other household objects. Explore how string telephones or ear gongs work. Explore altering the pitch or volume of objects, such as the length of a guitar string, amount of water in bottles, size of tuning forks. Measure sounds over different distances. Measure sounds through different insulation materials.

		• *Can I work out which materials give the best insulation for sound?*			
Electricity	identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 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 recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors	• Can I identify a common appliance that runs on electricity? • Can I construct a simple series electric circuit? • Can I identify a name, the basic part in the series, circuit (cells, wires, bulbs, switches and buzzers?) • Can I identify whether or not a lamp will light in a simple series circuit? • Can I recognise that a switch opens and closes a circuit? • Can I associate a switch opening with whether or not a lamp lights in a simple series circuit? • Can I recognise common conductors and insulators? • Can I associate metals with being good conductors? • *Can I make a bulb go on and off?* • *Can I say what happens to the electricity when more batteries are added?* • *Can I explain how a light bulb might get lighter?* • *Can I recognise if all metals are conductors of electricity?* • *Can I work out which metals can be used to connect across a gap in a circuit?* • *Can I explain why cautions are necessary for working safely with electricity?*	Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit,the component will not work. A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity.	Electricity Electrical device / appliances Mains/Plug Components Conductor Insulator Circuit symbol Cell/Battery Wire Bulb Switch Buzzer Motor Connection Electrical / simple circuit Complete/ Closed/Open circuit Positive Negative Crocodile clip	Construct a range of circuits. Explore which materials can be used instead of wires to make a circuit. Classify the materials that were suitable/not suitable for wires. Explore how to connect a range of different switches and investigate how they function in different ways. Choose switches to add to circuits to solve particular problems, such as a pressure switch for a burglar alarm. Apply their knowledge of conductors and insulators to design and make different types of switch. Make circuits that can be controlled as part of a DT project. N.B. Children should be given one component at a time to add to circuits.

Year 5
Working Scientifically Core Vocabulary UKS2 (Y5/6)
measurements, accuracy, precision, repeat readings, further comparative tests, identify, classify and describe, patterns, systematic, quantitative measurements

Science Curriculum Overview Schools Designed:

Research: hypothesis, variables, plan
Equipment: test tubes, test tube rack, observatory, telescope, lazer light
Data: gather, standard units, record, classification, present
Record: scientific diagram, bar charts, scatter graphs, line graphs
Report and Present: explanations, presentation, anomalies, support, refute, analysis
Biology, Chemistry, Physics

Theme:	**NC objectives covered:**	**Skills progression – bold denotes core skills:**	**Knowledge – bold denotes core knowledge**	**Core vocabulary**	**Scientific Investigation**
Living things and their habitats	describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals.	• Can they describe the differences in the life cycles of a mammal, an amphibians, an insects and a bird? • Can they describe the life cycles of common plants? • Can they explore the work of well know naturalists and animal behaviourists? (David Attenborough and Jane Goodall) • Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies? • Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border? • Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?	As part of their life cycle,plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals,including humans,have offspring which grow into adults. In humans and some animals,these offspringwill be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects.	Reproduction Sexual Asexual Germination Pollination Birth Fertilisation Menstrual cycle Puberty Seed dispersal Seed formation Pollen Stamen Stigma Anther Filament Style Sepal Carpel Insect Eggs Live young Egg Cell Embryo Ovary Placenta Penis Testes Vagina Uterus	Use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals. Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth. Look for patterns between the size of an animal and its expected life span. Grow and observe plants that reproduce asexually e.g. strawberries, spider plants, potatoes. Take cuttings from a range of plants e.g. African violet, mint. Plant bulbs and then harvest to see how they multiply. Use secondary sources to find out about pollination.
Animals, including humans	describe the changes as humans develop to old age.	• **Can they describe the changes as humans develop to old age?** • **Can they describe the changes experienced in puberty?**	When babies are young,they grow rapidly. They are very dependent on their parents. As they develop,they learn many skills. At puberty, a child's body changes and	As above	This unit is likely to be taught through direct instruction due to its sensitive nature, although children can carry out a research

		• **Can they draw a timeline to indicate stages in the growth and development of humans?**	develops primary and secondary sexual characteristics. This enables the adult to reproduce.This needs to be taught alongside PSHE. The new statutory requirements for relationships and health education can be found below:•statutory guidance on Physical health and mental wellbeing (primary and secondary).Other useful guidance includes:•Joint briefing on teaching about puberty in KS2 from PHSE Association and Association for Science Education•Briefing on humans development and reproduction in the Primary Curriculum from PHSE Association and Association for Science Education.		enquiry by asking an expert e.g. (school nurse) to provide answers to questions that have been filtered by the teacher. Show photos of people in old age and what they looked like in younger days. Ask children to bring in photos of grandparents.
Properties and changes of materials	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 know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating give reasons, based on evidence from	• Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets? • Can they explain how some materials dissolve in liquid to form a solution? • Can they describe how to recover a substance from a solution? • Can they use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, evaporating? • Can they give reasons, based on evidence for comparative and fair tests for the uses of everyday materials, including metals wood and plastic? • Can they describe changes using scientific words? (evaporation, condensation) • Can they demonstrate that dissolving, mixing and changes of state are reversible changes? • Can they 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?	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. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation. Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.	Solubility Electrical conductivity Thermal conductivity New material Buoyancy suspension Dissolve Solution Soluble Insoluble Solute Solvent Burning Rusting Gas given off Mixture Filtering Sieving Reversible change Irreversible change Hard to reverse	Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat. Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate. Investigate rates of dissolving by carrying out comparative and fair test. Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture. Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning. 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? Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton).

	comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	• Can they use the terms 'reversible' and 'irreversible'? • Can they describe methods for separating mixtures? (Filtration, distillation) • Can they work out which materials are most effective for keeping us warm or for keeping something cold? • Can they use their knowledge of materials to suggest ways to classify? (Solids, liquids, gases) • Can they explore changes that are difficult to reverse, e.g., burning, rusting and reactions such as vinegar with bicarbonate of soda? • Can they explore the work of chemists who create new materials, e.g., Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)?			
Earth and Space	describe the movement of the Earth, and other planets, relative to the Sun in the solar system describe the movement of the Moon relative to the Earth describe the Sun, Earth and Moon as approximately spherical bodies use the idea of the Earth's rotation to explain day and night and the apparent	• Can they identify and explain the movement of the Earth and other plants relative to the sun in the solar system? • Can they explain how seasons and the associated weather is created? • Can they describe and explain the movement of the Moon relative to the Earth? • Can they describe the sun, earth and moon as approximately spherical bodies? • Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky? • Can they compare the time of day at different places on the earth? • Can they create shadow clocks? • Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge?	The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates,the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical.	Earth Planets Sun Solar system Moon Celestial body Sphere / spherical Rotation Spin Phases of moon Axis / axes Night / day Mercury Mars Neptune Venus Jupiter Saturn Pluto Uranus Time zones	Use secondary sources to help create a model e.g. role play or using balls to show the movement of the Earth around the Sun and the Moon around the Earth. Use secondary sources to help make a model to show why day and night occur. Make first-hand observations of how shadows caused by the Sun change through the day. Make a sundial. Research time zones. Consider the views of scientists in the past and evidence used to deduce shapes and movements of the Earth, Moon and planets before space travel.

	movement of the sun across the sky.	• Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)		Orbit Elliptical orbit Revolve Shadow clocks Sundials Asteroids Comets Galaxy Meteors Light years	
Forces	explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	• Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object? • Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces? • Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect? • Can they describe and explain how motion is affected by forces (including gravitational attractions, magnetic attraction and friction) • Can they design very effective parachutes? • Can they work out how water can cause resistance to floating objects? • Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation?	A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water,or the air and water may be moving over a stationary object. A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines.	Mechanisms Air resistance Water resistance Levers Pulleys Gears Springs Drag forces Transference of force and motion	Investigate the effect of friction in a range of contexts e.g. trainers, bathmats, mats for a helter-skelter. Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water and pulling shapes, such as boats, along the surface of water. Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats. Explore how levers, pulleys and gears work. Make a product that involves a lever, pulley or gear. Create a timer that uses gravity to move a ball. Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.

Year 6
Working Scientifically Core Vocabulary UKS2 (Y5/6) measurements, accuracy, precision, repeat readings, further comparative tests, identify, classify and describe, patterns, systematic, quantitative measurements **Research**: hypothesis, variables, plan **Equipment**: test tubes, test tube rack, observatory, telescope, lazer light **Data**: gather, standard units, record, classification, present

Science Curriculum Overview Schools Designed:

Record: scientific diagram, bar charts, scatter graphs, line graphs
Report and Present: explanations, presentation, anomalies, support, refute, analysis
Biology, Chemistry, Physics

Theme:	**NC objectives covered:**	**Skills progression – bold denotes core skills:**	**Knowledge – bold denotes core knowledge**	**Core vocabulary**	**Scientific Investigation**
Living things and their habitats	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 give reasons for classifying plants and animals based on specific characteristics.	• Can they 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? • Can they give reasons for classifying plants and animals based on specific characteristics? • Can they explain why classification is important? • Can they readily group animals into reptiles, fish, amphibians, birds and mammals? • Can they sub divide their original groupings and explain their divisions? • Can they group animals into vertebrates and invertebrates? • Can they find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification?	Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other livings things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot. Animals can be divided into two main groups:those that have backbones (vertebrates);and those that do not (invertebrates). Vertebrates can be divided into five small groups: fish;amphibians;reptiles;birds;and mammals. 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.	Organism Micro-organism Classification Bacteria Microbes Fungus Name invertebrates: arachnid, mollusc, insect and crustacean	Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important. Use first-hand observation to identify characteristics shared by the animals in a group. Use secondary sources to research the characteristics of animals that belong to a group. Use information about the characteristics of an unknown animal or plant to assign it to a group. Classify plants and animals, presenting this in a range of ways e.g. Venn diagrams, Carroll diagrams and keys. Create an imaginary animal which has features from one or more groups.
Animals, including humans	identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood 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	• Can they identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood? • Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function? • Can they describe the ways in which nutrients and water and transported within animals, including humans? • Can they explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies? • Can they compare the organ systems of humans to other animals? • Can they make a diagram of the human body and explain how different parts work and depend on one another? • Can they name the major organs in the human body? • Can they locate the major human organs? • Can they make a diagram that outlines the main parts of a body?	The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used,they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins.This content is also included in PSHE. The new statutory requirements for	Circulatory system Blood vessels Capillaries Arteries Veins Red blood cells White blood cells Heart Valve Oxygen Carbon dioxide Lungs Air sacs Ventricles Aorta Wind pipe Diaphragm Bronchi Pulmonary vein / artery Lifestyle	Create a role play model for the circulatory system. Carry out a range of pulse rate investigations: fair test –effect of different activities on my pulse rate pattern seeking –exploring which groups of people may have higher or lower resting pulse rates observation over time -how long does it take my pulse rate to return to my resting pulse rate (recovery rate) pattern seeking –exploring recovery rate for different groups of people. Research the negative effects of drugs (e.g. tobacco) and the benefits of a healthy diet and regular exercise by asking an expert or using carefully selected secondary sources.

			relationships and health education can be found below:	Drugs Diet Heart rate Clotting Plasma transport	
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 recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	• Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago? • Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents? • Can they give reasons why offspring are not identical to each other or to their parents? • Can they explain the process of evolution and describe the evidence for this? • Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution? • Can they talk about the work of Charles Darwin, Mary Anning and Alfred Wallace? • Can they explain how some living things adapt to survive in extreme conditions? • Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet? • Can they begin to understand what is meant by DNA?	All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly,some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suitedsurvive in greater numbers to reproduce and pass their characteristics on to their young. Over time,these inherited characteristics become more dominant within the population. Over a very long period of time,these characteristics may be so different to how they were originally that a new species is created. This is evolution. Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.	Evolution Adaptation Genes/Genetics DNA Chromosomes Evolutionary change Features Inherit Inheritance Environmental conditions Fossil records Natural selection Characteristics Variation Reproduction Competition Environmental variations Survival of the fittest	Design a new plant or animal to live in a particular habitat. Use models to demonstrate evolution e.g. ‘Darwin’s finches’ bird beak activity. Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution. Make observations of fossils to identify living things that lived on Earth millions of years ago. Identify features in animals and plants that are passed on to offspring and explore this process by considering the artificial breeding of animals or plants e.g. dogs. Compare the ideas of Charles Darwin and Alfred Wallace on evolution. Research the work of Mary Anning and how this provided evidence of evolution.

Science Curriculum Overview Schools Designed:

Light	recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	• Can they recognise that light appears to travel in straight lines? • Can they 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? • Can they explain that we see things because light travels from light sources to our eyes or from light sources to object s and then to our eyes? • Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them? • Can they explain how different colours of light can be created? • Can they use and explain how simple optical instruments work? (Periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope) • Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.	Light appears to travel in straight lines,and we see objects when light from them goes into our eyes. The light may come directly from light sources,but for other objects some light must be reflected from the object into our eyes for the object to be seen.Objects that block light (are not fullytransparent) will cause shadows.Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.	Absorption Transmission Lenses Optics Prism Rainbow Refraction reflection spectrum	Explore different ways to demonstrate that light travels in straight lines e.g. shining a torch down a bent and straight hose pipe, shining a torch through different shaped holes in card. Explore the uses of the behaviour of light, reflection and shadows, such as in periscope design, rear view mirrors and shadow puppets.
Electricity	associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches	• Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers) • Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches? • Can they use recognised symbols when representing a simple circuit in a diagram? • Can they explain the danger of short circuits? • Can they explain what a fuse is? • Can they explain how to make changes in a circuit? • Can they explain the impact of changes in a circuit? • Can they explain the effect of changing the voltage of a battery?	Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well.You can use recognised circuit symbols to draw simple circuit diagrams.	Series circuit Parallel circuit Volts Amps Terminal Voltage Volume Current Resistance Circuit diagrams	Explain how a circuit operates to achieve particular operations, such as to control the light from a torch with different brightnesses or make a motor go faster or slower. Make circuits to solve particular problems, such as a quiet and a loud burglar alarm. Carry out fair tests exploring changes in circuits. Make circuits that can be controlled as part of a DT project.

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