

Science Curriculum 2023/24 – Years 3 & 4

	Autumn 1	Autumn 2
Topic	<p>Living Things in Their Habitats</p> <p>Children will learn how to group living things in a variety of ways, and will talk about the ways in which they have grouped them. Children will learn what a classification key is and how to use it to help them identify and name living things in their local and wider environment. Children will look at some of the ways in which environments can change and the positive and negative effects it has on the living things. They will learn about the work of Charles Waterton, that he had an interest in wildlife and a passion to protect it.</p>	<p>States of Matter</p> <p>Children will learn about all matter being made up of particles and that these are arranged in a certain way that define a substance as a solid, liquid or gas. They will learn about and investigate that water, and other substances, can change states of matter at different temperatures. Children will learn about the processes of evaporation and condensation and relate this understanding to changes of state within the water cycle.</p>
Knowledge	<p>Knowledge</p> <ul style="list-style-type: none"> Know that animals can be grouped in a variety of ways for example: fish, amphibians, reptiles, birds, and mammals; and snails and slugs, worms, spiders, and insects Know that plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants (for example ferns and mosses) Know that classification keys can help us to group, identify and name living things Know that environments can change and that this can sometimes pose dangers to living things. Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation Know that Charles Waterton created the world's first nature reserve at Waterton Hall, Wakefield, making him one of the world's first environmentalists. He also invented the bird nesting box. David Attenborough has described him as "one of the first people anywhere to recognise, not only that the natural world was of great importance, but that it needed protection as humanity made more and more demands on it" <p>Skills</p> <ul style="list-style-type: none"> Know how to raise and answer questions to help identify plants and animals in their habitat Know how to use classification keys to help group, identify and name a variety of living things in their local and wider environment 	<p>Knowledge</p> <ul style="list-style-type: none"> Know simple descriptions of each state of matter, for example: solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container Know that materials can be grouped whether they are solids, liquids or gases, depending on the arrangement of the particles it is made up of Know what is happening to the particles as a substance changes state, for example: as liquids are heated, the particles gain more energy and move more, taking up more space – expanding Know that water changes state when it is heated or cooled Know that some other substances, like chocolate, butter, iron and oxygen, change state at different temperatures Know the part played by evaporation and condensation in the water cycle Know that the rate of evaporation is affected by temperature <p>Skills</p> <ul style="list-style-type: none"> Know how to compare and group materials together, according to whether they are solids, liquids or gases, using sorting tables Know how to set up simple enquiries, comparative and fair tests Know how to research and take accurate measurements, using thermometers, of the temperature at which materials change state in degrees Celsius (°C) Know how to record evaporation over a period of time using simple scientific language, labelled diagrams and tables (they may begin to look at line graphs how they represent a value over time)
Vocab	classification key, habitat, vertebrate, invertebrate, flowering, non-flowering, population, deforestation, pollution, deforestation, nature reserve, conservation	water vapour, condensation, precipitation, evaporation, substance matter, solid, liquid, gas, particles, boiling point, melting point



Science Curriculum 2023/24 – Years 3 & 4

	Spring 1	Spring 2
Topic	<p>Electricity</p> <p>Children will learn about common electrical appliances and that there are safety precautions when working with electricity. Children will learn how to construct simple series circuits. They will become familiar with the names of the basic parts and how to draw them. They will be able to identify whether or not a bulb will light in a simple series circuit, by being able to identify a complete circuit.</p>	<p>Electricity</p> <p>Learning will continue from Spring 1. The children will learn that Joseph Swan and Thomas Edison were known for the invention of the light bulb. They will learn about switches and that a switch needs to be closed in order for a bulb to light. Children will relate this learning about switches to the use of everyday electrical devices, i.e. a light switch, a house alarm system. They will investigate and explore which materials are conductors and insulators, and they will observe patterns, whether or not some materials are better than others.</p>
Knowledge	<p>Knowledge</p> <ul style="list-style-type: none"> • Know of common appliances that run on electricity • Know that electricity can be dangerous and there are precautions we need to take in order to work safely with electricity • Know that a battery or cell stores electricity • Know common appliances that run on electricity, and that they either plug in to the mains or have a battery • Know the names of the basic parts of a simple series circuits, including cells, wires, bulbs, switches and buzzers • Know that a simple series circuit needs to have a complete loop and a battery in order for a bulb to light <p>Skills</p> <ul style="list-style-type: none"> • Know how to construct a simple series circuit, using the electricity kits, trying different components including: bulbs, buzzers and motors • Know how to draw the circuit as a pictorial representation, but not using conventional circuit symbols at this stage; these will be introduced in year 5/6 	<p>Knowledge</p> <ul style="list-style-type: none"> • Know that Joseph Swan, alongside Thomas Edison, is the person most credited with the invention of the light bulb • Know that a switch open and closes a circuit and that this determines whether or not a bulb will light in a simple series circuit • Know that circuits are used in everyday electrical devices • Know that some common materials are conductors and insulators <p>Skills</p> <ul style="list-style-type: none"> • Know how to construct a simple series circuit, trying different components, including bulbs, buzzers, motors and including switches, and use their circuits to create simple devices • Know how to draw the circuit as a pictorial representation, including switches • Know how to observe patterns, that metals tend to be good conductors of electricity • Know how to record and report findings using simple scientific language, tables and labelled diagrams
Vocab	<p>simple series circuit, wire, battery, cell, bulb, buzzer, motor, mains, appliance (Note: cells and batteries are used interchangeably)</p>	<p>circuit, wire, battery, cell, bulb, buzzer, motor, switch, mains, appliance, conductor, insulator (Note: cells and batteries are used interchangeably)</p>



Science Curriculum 2023/24 – Years 3 & 4

	Summer 1	Summer 2
Topic	<p>Animals Including Humans</p> <p>Children will revisit their learning about carnivores, herbivores and omnivores and learn about predator-prey relationships, using examples from British wildlife. They will explore food chains and food webs, emphasising the change in numbers as energy is lost at each stage. Children will look at the different types of human teeth, considering their functions. They will understand the need to look after them, and think about the diet choices that we can make to ensure that our teeth function healthily for as long as possible. In this unit, children will learn about the digestive system, the functions of each part and the importance of having a balanced diet to keep each part functioning fully.</p>	<p>Sound</p> <p>In this unit, children will explore making sounds in lots of different ways, and they will explore sound using a range of musical instruments. Children will learn how we hear sounds, due to vibrations, and that sound waves travel through a medium, such as water or air, before reaching our ear. They will explore how the volume and pitch of sounds can be changed, by the features of an object or by the distance of the sound source. They will learn about the work of famous and modern day scientists, including Alexander Bell and Caoimhe Doyle.</p>
Knowledge	<p>Knowledge</p> <ul style="list-style-type: none"> Know that the mouth, tongue, teeth, oesophagus, stomach, small and large intestine and the anus are the main body parts associated with the digestive system Know the simple functions of the basic parts of the digestive system in humans Know that a balanced diet will help our digestive system to function (e.g. calcium for teeth; fibre for digestion; water for the large intestine) Know about the different types of teeth in humans (incisors, canines, pre-molars and molars) and their simple functions Know that a food chain includes consumer, producers, predators and prey Know that the scientist, Washington Sheffield, invented the first modern toothpaste in a tube and how this had impacted on us today <p>Skills</p> <ul style="list-style-type: none"> Know how to draw and discuss their ideas about the parts of the digestive system and compare them with models and images to help them to understand their special functions Know how to construct and interpret a variety of food chains, identifying the producers, predators and prey Know how to set up simple practical enquiries, including comparative and fair tests to investigate what damages teeth Know how to report back on findings, including oral and written explanations, displays or presentations 	<p>Knowledge</p> <ul style="list-style-type: none"> Know that sounds are made when something is vibrating, creating a sound wave Know that vibrations from sounds travel through a medium to the ear Know that the features of an object alter the pitch of a sound Know that sounds get fainter as the distance from the sound source increases Know that Alexander Bell invented the telephone and understand the importance of his invention Know that scientists today have jobs working with sound, in particular learning about Caoimhe Doyle, who creates sounds effects for films <p>Skills</p> <ul style="list-style-type: none"> Know how to set up simple comparative tests to find out how the pitch and volume can be changed in a variety of ways Know how to identify differences, similarities or changes related to the way sound is made through vibration in a range of different musical instruments Know how to find patterns in the sounds that are made by different objects such as saucepan lids of different sizes of elastic bands of different thicknesses
Vocab	carnivore, herbivore, omnivore, consumer, producer, predator, prey, food chain, digest, mouth, teeth, tongue, saliva, oesophagus, stomach, acid, small and large intestine, anus, calcium, fibre, water, teeth, incisors, canines, pre-molars and molars, cut, tear, grind, crush	sound wave, vibration, instrument, volume, pitch, distance



Science Curriculum 2024/25 – Years 3 & 4

	Autumn 1	Autumn 2
Topic	<p>Rocks and Soils</p> <p>Children will look at different rocks in places e.g. chalk cliffs, sandstone cliffs, limestone pavements, granite outcrops etc. They will learn about three types of naturally occurring rock, learning simply how these are formed. They will learn that rock broken down into tiny particles makes soil, along with organic matter. Children will observe samples of rocks, looking at fossils and crystals. They will test the properties of different kinds of rock. Children will learn about the scientists: William Smith and Dr Lisa Marie.</p>	<p>Animals including Humans</p> <p>Children will revisit that animals need air, water and sleep to survive. They will learn that animals need the right amounts of nutrition, learning about the five main food groups. Children will learn about the skeleton, including the names of major bones and the role of parts such as the skull and rib cage; and they will look at a variety of different skeletons in animals. They will look at how muscles work, including the learning the names of major muscles and of their roles. Children will learn about the scientists: Marie Curie and Toby Gemmill</p>
Knowledge	<p>Knowledge</p> <ul style="list-style-type: none"> Identify and describe three types of naturally occurring rock Know that that outer layer of the Earth is made for rock 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, and that soils are different Know that William Smith found that he could tell the age of a rock by looking at the fossils inside it Know about the work of Dr Lisa Marie, a geoarchaeologist, who uses science to work out how people lived thousands of years ago by examine their rubbish, including poo, dating back to the Stone Age <p>Skills</p> <ul style="list-style-type: none"> Know how to compare and group together different kinds of rocks, based on their appearance and simple physical properties, also thinking about their uses Know how to observe rocks, including those used in buildings and gravestones in their local environment, and explore how and why they might have changed over time Know how to use a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals and whether they have fossils in them Know how to research and discuss the different kinds of living things whose fossils are found in sedimentary rock Know how to raise and answer questions about different kinds of rocks or the way soils are formed Know how to set up simple comparative and fair tests 	<p>Knowledge</p> <ul style="list-style-type: none"> Know that animals, including humans, cannot make their own food; they get nutrition from what they eat Identify that animals, including humans, need the right types and amount of nutrition, learning about the five main food groups Identify that humans and some other animals have skeletons and muscles for support, protection and movement Know the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions Know that Marie Curie developed the use of x-rays and learn about the work of an orthopaedic vet: Toby Gemmill <p>Skills</p> <ul style="list-style-type: none"> Know how to identify and group animals with and without skeletons and observe and compare their movement Know how to explore ideas about what would happen if humans did not have skeletons Know how to compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. Know how to record data using simple scientific language, bar charts and tables Know how to research different food groups and how they keep us healthy, and design meals based on what they find out
Vocab	<p>granite, sandstone, limestone, marble, slate, chalk, clay, brick, concrete, igneous, metamorphic, sedimentary, hard, soft, rough, smooth, shiny, dull, permeable, crystals, molten rock, pressure, durable, fossils, organic matter, weathering, erosion, decompose, compost</p>	<p>carnivore, herbivore, omnivore, producer, predator, prey, nutrition, diet, carbohydrates, fruit and vegetables, protein, dairy, fats, sugar, vitamins, food chain, teeth, incisors, canines, pre-molars and molars, cut, tear, grind, crush, skeleton, bones, skull, jaw, spine, rib cage, pelvis, humerus, femur, support, protection, upright, vital organs, joints, muscles contract, relax, abdominals, biceps, triceps, quadriceps, hamstrings</p>



Science Curriculum 2024/25 – Years 3 & 4

	Spring 1	Spring 2
Topic	<p>Forces</p> <p>Children will explore forces, revising that a force is a push, pull or a twist, making things move. They will learn that forces can act on a stationary object and that they cause something to speed up, slow down, change speed or change direction. Children will draw their own conclusions of how easy it is to push or pull something, depending whether it is a smooth or rough surface. They will explore sending a vehicle down a ramp on different surfaces, timing how long it takes and looking at the effect of friction. They may use their results to predict new values and raise further questions to investigate.</p>	<p>Forces and Magnets</p> <p>Children will build on their understanding of forces, learning that magnetism is a force which can act at a distance, unlike other forces. They will explore different kinds of magnets and see that they attract or repel each other as well as materials. Time will be spent grouping materials based on whether they are magnetic and they will be able to draw their own conclusions about the things that are magnetic or not. Children will test the strength of different magnets and think about their uses in everyday life.</p>
Knowledge	<p>Knowledge</p> <ul style="list-style-type: none"> Know that things move differently on different surfaces: grass, gravel, sand, road Know that some forces need contact between two objects <p>Skills</p> <ul style="list-style-type: none"> Know how to raise questions and carry out simple practical enquiries to find out how far things travel on different surfaces and group them Know how to make systematic and careful observations and take accurate measurements using standard units using rulers, tape measures and stop watches Know how to recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Know how to report findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions, to find answers to their questions Know how to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 	<p>Knowledge</p> <ul style="list-style-type: none"> Know that magnets have two poles: North and South Know that some forces need contact between two objects, but magnetic forces can act at a distance Know that two magnets will attract or repel each other, depending on which poles are facing <p>Skills</p> <ul style="list-style-type: none"> Know how to test the strengths of different magnets (for example, bar, ring, button and horseshoe) Know how to set up simple practical enquiries, comparative and fair tests Know how to recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Know how to observe how magnets attract or repel each other, without direct contact (unlike most forces where direct contact is necessary) and attract some materials and not others Know how to 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
Vocab	force, push, pull, twist fiction, surface, roughness, friction, motion, speed up, slow down, stop (<i>gravity is taught in year 5</i>)	magent, magnetic, magnetic field, poles, North, South, repel, attract, metals, iron, nickel, colbalt



Science Curriculum 2024/25 – Years 3 & 4

	Summer 1	Summer 2
Topic	<p>Light</p> <p>Children will learn that darkness is the absence of light – they will understand that some people find darkness scary as we can't see in the dark. Children will learn that we need light in order to see things and it comes from a range of different light sources. They will learn the fact that all the natural light on Earth comes from the sun. Children will explore reflection from different surfaces and they will learn that the moon reflects the light from the sun. Children will explore shadows, learning that a shadow occurs when light is blocked by opaque objects. They will investigate ways in which the size of a shadow changes.</p>	<p>Plants</p> <p>Children will learn about the structure of flowering plants and will be introduced to the relationship between structure and function: the idea that every part has a job to do. They will examine a plant, labelling all of its parts and they will look at a variety of flowering plants, knowing that their requirements vary. They will investigate and know what a plant needs to grow and to survive. Children will investigate and explore how water is transported in plants and they will learn about the part played by flowers in the life cycle of flowering plants.</p>
Knowledge	<p>Knowledge</p> <ul style="list-style-type: none"> Know we need light in order to see things Know that dark is the absence of light Know that a light source is anything that makes its own light Know that all the natural light on Earth comes from the sun and that the moon reflects the light from the sun Know that light is reflected from surfaces Know that light from the sun can be dangerous and that there are ways to protect their eyes Know not to look directly into the sun or other bright lights, even when wearing dark glasses Know that shadows are formed when the light from a light source is blocked by an opaque object, and that the size of them changes Know that the scientist, Arthur James Wilson invented car wing mirrors <p>Skills</p> <ul style="list-style-type: none"> Know how to explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves Know how to look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change Know how to find patterns in what happens to the size of shadows when the light source moves or the distance between the light source and the object changes 	<p>Knowledge</p> <ul style="list-style-type: none"> Know the structure and functions of different parts of flowering plants: roots, stem, trunk, leaves and flowers (the idea that every part has a job to do) Know plants require air, light, water, nutrients from the soil and room to grow in order to survive, and that this varies from plant to plant Know how water is transported within plants Know the part played by flowers in the life cycle of flowering plants: pollination, seed formation and seed dispersal Know about the work of George Washington Carver, that he came up with ways of developing the soil so that farmers could grow crops – he was the most prominent black scientist of the 20th Century <p>Skills</p> <ul style="list-style-type: none"> Know how to explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction Know how to compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser Know how seeds are formed by observing the different stages of plant life cycles over a period of time Know how to look for patterns in the structure of fruits that relate to how the seeds are dispersed. Know how to investigate the way in which water is transported within plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers
Vocab	light, light source, dark, shadow, reflection/ reflect/ reflective, surface, opaque, transparent	air, light, water, nutrients, transport, roots, stem, trunk, leaves, flowers, life cycle, pollination, pollinator, seed formation, seed dispersal, germination, stigma, stamen, petal

