



Science – Subject Content Overview

Science Intent

The National Curriculum for Science aims to ensure that all children develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. They develop an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them. The children are equipped with the scientific skills required to understand the uses and implications of science, both today and in the future.

We understand that it is essential for scientific vocabulary, knowledge and skills to be acquired through practical, hands on experience in which knowledge is consolidated, applied, tested and built upon. We encourage children to be inquisitive and to ask questions so that they are equipped to enjoy a lifelong interest, appreciation and respect for the world in which they live. Thus, as children grow at Sandal Magna, they gain a deeper understanding of key science concepts and talk about these with increasing scientific vocabulary and confidence in their own subject knowledge.

	Communication and Language	PSED	Understanding of the World
Nursery	<ul style="list-style-type: none"> Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" 	<ul style="list-style-type: none"> Make healthy choices about food, drink, activity and toothbrushing. 	<ul style="list-style-type: none"> Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Begin to make sense of their own life-story and family's history. Explore how thingswork. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.
Reception	<ul style="list-style-type: none"> Learn new vocabulary. Ask questions to find out more and to check 	<ul style="list-style-type: none"> Being a safe pedestrian Know and talk about the different factors that support their overall health and 	<ul style="list-style-type: none"> Explore the natural world around them. Describe what they see, hear and feel while they are outside.



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	<p>what has been</p> <ul style="list-style-type: none"> • said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts. 	<p>wellbeing:</p> <ul style="list-style-type: none"> ○ regular physical activity ○ healthy eating ○ toothbrushing ○ sensible amounts of ‘screen time’ ○ having a good sleep routine 	<ul style="list-style-type: none"> • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.
ELG	<p>Listening, attention and understanding:</p> <ul style="list-style-type: none"> • Make comments about what they have heard and ask questions to clarify their understanding 	<p>Managing self:</p> <ul style="list-style-type: none"> • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. 	<p>The Natural World:</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
	<p>Year 1 Working Scientifically:</p> <ul style="list-style-type: none"> • observing closely, using simple equipment • Asking simple questions and recognising they can be answered in different ways • 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 		



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Year 1	Plants	Humans	Materials	Animals	Seasons
	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p>	<p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>
Vocabulary	<p>plant, flower, tree, fruit, vegetables, root, leaf, stem, flower, trunk, branch, seed, soil, to plant, to water, daisy, dandelion, buttercup, nettle, weeds, deciduous, evergreen, wild plant, oak tree, sycamore tree, birch tree, fir tree, holly tree, grow</p>	<p>: human, animal, mammal, reptile, amphibian, bird, carnivore, herbivore, omnivore, lizard, sense, sight, sound, touch, taste, smell, meat, plants</p>	<p>plastic, wood, rubber, mabric, metal, brick, rock, glass, paper, material, hard, soft, smooth, rough, squidgy, waterproof, strong, weak, bumpy, stretchy, see-through, breakable, cotton, wool, fleece</p>	<p>human, animal, mammal, reptile, amphibian, bird, carnivore, herbivore, omnivore, lizard, sense, sight, sound, touch, taste, smell, meat, plants</p>	<p>autumn, spring, winter, summer, season, sun, snow, rain, hail, wind, cold, hot, warm, grow, year, change, tree, plant, shadow, new life</p>
	<p>Year 2 Working Scientifically:</p> <ul style="list-style-type: none"> observing closely, using simple equipment Asking simple questions and recognising they can be answered in different ways 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 				



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Year 2	Humans	Everyday use of materials	Animals including humans	Living things and their habitats	Plants
	<p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> <p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>
Vocabulary		<p>plastic, wood, rubber, fabric, metal, brick, rock, glass, paper, material, hard, soft, smooth, rough, squidgy, waterproof, strong, weak, bumpy, stretchy, see-through, breakable, cotton, wool, fleece.</p>		<p>living, non-living, dead, herbivore, carnivore, omnivore, urban, woodland, pond, coast, microhabitat, mini beast, ocean, artic, tropical, desert, consumer, producer, predator, prey</p>	<p>: plant, flower, tree, fruit, vegetable, root, leaf, stem, flower, trunk, branch, seed, soil, to plant, to water, bulb, seedling, adult plant, compost, grow</p>



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	Year 3 Working Scientifically: <ul style="list-style-type: none"> Asking relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair tests Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings. 				
Year 3	Animals including humans Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Identify that humans and some other animals have skeletons and muscles for support, protection and movement	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 Describe magnets as having two poles Predict whether two magnets will attract or repel each other,	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.	Light Recognise that they need light in order to see things and that dark is the absence of light 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.	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. – Yr 2 20/21 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.



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		depending on which poles are facing.			
Vocabulary	vertebrates, invertebrates, insects, mammals, reptiles, fish, mini-beasts, birds, amphibians, skeleton, muscle, bone, ribs, spinal column, back bone, skull, joints, humerus, sockets, femur, collar bone, ulna, radius, hip, food, growth, healthy, unhealthy, fruit and vegetables, sugar, protein, carbohydrates, fat, dairy, vitamins, minerals, nutrients	force, push, pull, magnet, poles, attract, repel, magnetic, non-magnetic, metal, stronger, weaker, horseshoe magnet, bar magnet, ring magnet, movement bigger force, smaller force.	rocks, soils, stone, pebble, slate, marble, chalk, granite, sandstone, clay, hard, soft, permeable, acid, fossil, sedimentary, metamorphic, igneous, magma, bedrock	light, see, dark, reflect, surface, natural, star, sun, moon, blocked, solid, artificial, torch, candle, lamp, sunlight, dangerous, protect eyes, shadow	plant, flower, tree, fruit, vegetable, root, leaf, stem, flower, trunk. Branch, seed, bulb, blossom, pollen, seed dispersal, seedling, adult plant, compost, grow, reproduce, air, light, nutrients, soil
	Year 4 Working Scientifically: <ul style="list-style-type: none"> Asking relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair tests Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings. 				
Year 4	Living things and their habitats	Electricity	Sound	Animals including humans	States of matter
	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 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 how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear	Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains,	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)



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	<p>Identify and name a variety of plants and animals in their habitats, including micro-habitats</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. – from Y2 – make sure chn understand. 20/21</p> <p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>	<p>identifying producers, predators and prey.</p>	<p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>
Vocabulary	<p>organism, variation, classification, vertebrates, invertebrates, reptile, bird, mammal, amphibian, fish, global, local, characteristic, key, habitat, environment, wildlife, endangered, extinct, conservation</p>	<p>bulb holder, buzzer, battery, switch, bulb, device, cell, wire, motor, appliance, electrical insulator, electrical conductor, crocodile clip</p>	<p>Vocabulary: sounds, source, quiet, loud, soft, high, low, muffle, tension, ear, particle, air, faint, noise, vibrate, vibration, travel, loudness, volume, pitch</p>	<p>organism, variation, classification, vertebrates, invertebrates, reptile, bird, mammal, amphibian, fish, global, local, characteristic, key, habitat, environment, wildlife, endangered, extinct, conservation</p>	<p>solid, temperature, water cycle, precipitation, solidify, carbon dioxide, measure, liquid, heat, condensation, collection, boiling, oxygen, compare, gas, cool, condense, run off, particle, states of matter, group, property, thermometer, evaporation, melting, melt, droplet, helium, research, change, degree Celsius, freezing, freeze, air, natural gas, observe.</p>



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	Year 5 Working Scientifically: <ul style="list-style-type: none"> Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Using test results to make predictions to set up further comparative and fair tests Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Identifying scientific evidence that has been used to support or refute ideas or arguments. 				
Year 5	Earth and space	Forces	Materials	Animals including humans	Living things and their habitats
	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>Describe the movement of the Moon relative to the Earth</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p>	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p>	<p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p>	<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Describe the changes as humans develop to old age.</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p>



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	<p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p>		<p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>		
Vocabulary	<p>Earth, sun, moon, planet, star, space, revolve, orbit, spin, rotate, axis, solar system, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, shadow, time zone, full moon, waning crescent, first quarter, waning gibbous, waxing gibbous, waxing crescent, last quarter, new moon, reflect</p>	<p>friction, air resistance, water resistance, newton meter, surface area, push, pull, force, gravity, movement, drag, grip, slippery, contact, streamlined.</p>	<p>solid, liquid, gas, change, durable, flexible, soluble, insoluble, magnetic, thermal insulator, dissolving, evaporating, sieving, filtration, magnets, irreversible, heat, reversible.</p>	<p>Vocabulary: life cycle, birth, growth, reproduction, metamorphosis, aging, death, animal, mammal, amphibian, insect, bird, cubs, pups, hibernate, nocturnal, marsupial, reeding cycle, clutch, brood, hatch, fledge, prey, predator, reproduce, habitat, environment</p>	<p>mammal, reptile, amphibian, bird, fish, movement, respiration, life cycle, reproduction, excretion, nutrition, insect, sensitivity, growth, pollination</p>



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	Year 6 Working Scientifically: <ul style="list-style-type: none"> Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Using test results to make predictions to set up further comparative and fair tests Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Identifying scientific evidence that has been used to support or refute ideas or arguments. 				
Year 6	Humans	Light	Living things and their habitat (Animals)	Electricity	Evolution and inheritance
	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>	<p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Recognise that light appears to travel in straight lines</p> <p>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p> <p>Explain that we see things because light travels from light sources to our eyes or from</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>



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		<p>light sources to objects and then to our eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>			
Vocabulary	<p>circulatory system, heart, lungs, blood, artery, vein, alveoli, capillary, digestive, gas exchange, villi, nutrients, oxygen, alcohol, drugs</p>	<p>see, light, light source, light ray, eyes, travel, torch, light beam, sun, shadow, cast, reflection, block, rainbow, reflect, reflective, colours, mirror, direction, straight lines, bend, opaque, translucent, transparent</p>	<p>mammal, reptile, amphibian, bird, fish, micro-organism, bacteria, virus, fungi, characteristics, classify, environment, habitat, compare, features, classification key, key, sort, flowering plant, non-flowering plant</p>	<p>motor symbol, components, bulb holder, electrical insulator, buzzer symbol, appliance, negative, positive, cell, cell holder, battery, buzzer, switch, symbol, connection, safety, mains electricity, bulb symbol, dimmer, motor, flow, wire, battery symbol, bulb, switch, circuit, device, battery powered, positive, crocodile clips, renewable, non-renewable</p>	<p>Evolution, change over time, species, population, features, trait, inherited, characteristics, reproduce, offspring, variation, mutation, survive, survival of the fittest, adaptation, fossils, environment, genetics</p>