Sandy Lane Primary School

Science Curriculum



Working Scientifically



Plants, Animals, Humans, Habitats



Light, Sound, Electricty



Materials, States of Matter



Earth and Space



Forces, Magnets

Intent

At Sandy Lane Primary School, our science curriculum is designed to develop a deep sense of curiosity and wonder about the world. We believe that every child is a natural scientist—eager to ask questions, explore, and discover. Our intent is to nurture this curiosity and guide pupils through a carefully planned journey that builds scientific knowledge, understanding, and enquiry skills year on year.

We aim to ensure that children develop not only a secure grasp of key scientific concepts across biology, chemistry, and physics, but also the ability to think and work scientifically. From their earliest experiences in science, pupils are encouraged to observe closely, question thoughtfully, and begin to explore how and why things happen. As they progress, they learn to plan and carry out investigations, collect and analyse data, and draw conclusions based on evidence.

Our curriculum is designed to revisit and build upon key ideas, enabling children to connect new learning to what they already know. This deepens their understanding over time and helps them see the relevance of science in everyday life. We also place a strong emphasis on developing independence and critical thinking. By the time pupils reach upper Key Stage 2, they are able to approach scientific questions with confidence, select appropriate methods to investigate them, and evaluate their findings with increasing precision.

Ultimately, our intent is to provide a rich and engaging science education that prepares children for the next stage of their learning. We want them to leave Sandy Lane as enthusiastic, knowledgeable, and capable young scientists—ready to thrive in secondary school and inspired to explore the role of science in the wider world.

Implementation

At Sandy Lane Primary School, science is taught through a carefully sequenced curriculum that builds progressively on prior knowledge and skills. Our approach ensures that all pupils develop a secure understanding of scientific concepts

while becoming confident, independent thinkers.

From the early years, children are immersed in hands-on exploration and guided discovery. In EYFS and KS1, they are encouraged to ask simple questions about the world around them and begin to observe closely, using their senses. Investigations are supported by adults who model scientific language and enquiry. Pupils engage in practical activities that help them identify, name, and describe materials, objects, and living things. They begin to recognise patterns and simple changes, and start to make comparisons based on their direct experiences.

As pupils move into lower Key Stage 2, they begin to take more ownership of their learning. They are introduced to systematic observation and the use of standard scientific equipment, such as rulers, timers, and thermometers. Lessons involve opportunities for pupils to make predictions, plan simple fair tests, and collect data that is organised using tables and basic charts. They are taught how to identify variables in a fair test and how to record their findings with increasing accuracy and detail.

By the time pupils reach upper Key Stage 2, they are expected to apply their scientific knowledge and enquiry skills with greater independence. They confidently plan and carry out full investigations, selecting appropriate equipment and controlling variables where necessary. They collect data systematically and present it in a range of formats, including line graphs, classification keys, and scientific reports. Pupils are encouraged to draw conclusions based on evidence and to critically evaluate their methods and results, reflecting on what could be improved and why.

Throughout all year groups, science is made meaningful and relevant through real-life contexts, cross-curricular links, and engaging practical activities. Teachers carefully plan lessons that promote questioning, resilience, and problem-solving, helping pupils to develop a sense of curiosity and a desire to explore. Scientific enquiry is woven into every topic, enabling pupils to understand not just what scientists know, but how they come to know it.

This consistent and progressive approach to implementation ensures that all children leave Sandy Lane Primary School with a strong foundation in scientific knowledge and skills, ready to build on this in secondary education and beyond. Our science curriculum is structured to ensure pupils build on prior knowledge, revisit key concepts, and develop the ability to ask questions, test ideas, and explain findings:

Impact
By the end of Key Stage 2, pupils at Sandy Lane Primary School will: • Demonstrate a secure understanding of key scientific ideas and how they apply to the world around them. • Confidently apply a wide range of scientific enquiry skills, from planning and measuring to evaluating and concluding. • Show independence and resilience when tackling scientific questions and investigations. • Think critically about results and data, identifying patterns, raising further questions, and evaluating reliability. • Be well-equipped for the next stage of their education, having developed the scientific literacy, curiosity, and confidence needed for success in secondary school and beyond. Progress is monitored through formative and summative assessment, book scrutiny, and pupil discussions, ensuring all learners are supported and challenged to reach their full potential in science.

Progression

Progression Overview
The progression of science learning at Sandy Lane Primary School is carefully structured to develop pupils scientific knowledge, enquiry skills, and critical thinking over time. This progression ensures that children move from concrete experiences and basic observations in early years to systematic investigations, theoretical understanding, and independent enquiry by the end of primary school.

EYFS ELG: Understanding the World – The Natural World	Children at the expected level of development will: • 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.
Progression Overview	In EYFS at Sandy Lane School, science learning is embedded within children's everyday experiences and play, enabling them to explore the world around them through first-hand observation, investigation and discussion. Children develop curiosity about natural and physical phenomena by engaging with materials, living things and seasonal changes. Through structured adult-led activities and rich continuous provision, pupils learn to ask questions, make predictions, observe changes over time and talk about what they notice. Science learning in EYFS focuses on developing early enquiry skills such as sorting, comparing, describing and identifying patterns, laying the foundations for scientific thinking in Key Stage 1 and beyond.
Vocabulary Progression	Children in EYFS begin to use simple, descriptive vocabulary to talk about the world around them, including words related to materials, animals, plants and everyday phenomena. As their understanding develops, they are introduced to more specific scientific language such as float, sink, melt, freeze, grow, change, hard, soft, rough and smooth. Adults model and reinforce this vocabulary through questioning, shared exploration and story-based learning, supporting children to explain what they see and do using increasingly accurate terms. By the end of EYFS, children are able to describe features of their environment, talk about changes they observe and use appropriate scientific vocabulary in context.
Strand	Provision

Working Scientifically / Enquiry Skills	- Observe using senses & simple tools (magnifying glasses, torches, mirrors) - Ask questions, make predictions, talk about changes over time - Sort & group objects by properties - Record through drawings, photos, mark-making, oral explanations - Adults model scientific vocabulary & questioning (What do you notice? Why do you think that happened?)
Living Things & Habitats	- Planting, growing and caring for seeds, bulbs, and plants - Caring for class pets (where appropriate) - Bug hunts, outdoor exploration, seasonal walks - Compare animals and plants - Books & non-fiction texts about habitats
Materials & Their Properties	- Water and sand play - Construction and junk modelling - Investigate floating/sinking, melting/freezing, mixing/dissolving - Sort materials by properties (hard/soft, rough/smooth, heavy/light) - Explore changes in materials through cooking, ice, mud kitchen
Forces, Light & Sound	- Explore pushes, pulls, movement using ramps, wheeled toys, outdoor equipment - Explore light with torches, mirrors, shadow play - Explore sound with instruments, listening walks, objects - Early understanding of cause and effect
Seasonal Change & Environment	- Daily & weekly weather observations - Seasonal changes recorded through artwork, photos, displays - Outdoor learning across the year - Explore ice, water, sunlight - Talk about differences between local environments & contrasting ones

Detailed Progression Overview

Key Stage 1 and 2

From Exploration to Investigation: Developing Scientific Enquiry Skills

A key aspect of progression in science is the development of working scientifically skills. In early years and KS1, pupils engage in hands-on experiences, using observation and simple questioning to explore the world around them. They identify, name, and describe objects, materials, and living things based on their direct experiences. In LKS2, children begin to conduct systematic observations, measure using standard equipment (e.g., rulers, thermometers), and organise their findings using tables and bar charts. They also start making simple predictions and drawing conclusions based on their results. By UKS2, pupils are expected to carry out full investigations independently, control variables, and use more precise methods of data collection, analysis, and presentation (e.g., line graphs, classification keys). They are also encouraged to evaluate the reliability of their methods and justify their conclusions using evidence, preparing them for the demands of secondary science.

Conceptual Understanding: Building Knowledge Over Time

Science topics are carefully sequenced to build on prior learning, ensuring that children revisit key concepts at greater depth as they progress.

Living Things & Biology:

In KS1, children learn to identify and classify plants and animals based on simple characteristics. In LKS2, they explore life cycles, habitats, and basic body systems (e.g., digestion, skeleton, muscles). By UKS2, they study the circulatory system, adaptation, evolution, and ecosystems, applying their knowledge to explain real-world biological processes.

Materials & Chemistry:

In KS1, pupils explore the physical properties of materials (hard, soft, waterproof). In LKS2, they begin investigating states of matter (solid, liquid, gas) and changes like evaporation and condensation. In UKS2, they learn about solubility, conductivity, and irreversible chemical changes (e.g., burning, rusting).

Forces, Energy & Physics:

In KS1, children explore movement and light in basic terms. In LKS2, they study magnets, friction, shadows, and sound. By UKS2, pupils examine gravity, air resistance, refraction, and electricity in greater depth, using calculations and precise measurements.
Each phase revisits earlier ideas while introducing new scientific principles and applications, allowing pupils to deepen their understanding progressively.

Progression in Independence and Critical Thinking

In KS1, pupils explore through guided discovery and teacher-led investigations. In LKS2, they begin planning their own fair tests with increasing independence. By UKS2, pupils work like real scientists, designing experiments, analysing patterns, and reflecting on their findings.

This step-by-step approach ensures that pupils at Sandy Lane Primary School develop confidence in scientific enquiry, preparing them for the challenges of secondary school and beyond.

The structured progression of science skills in our school allows pupils to build on prior knowledge, refine their enquiry skills, and develop a deep understanding of scientific concepts. By moving from simple exploration to independent investigation, children gain the scientific literacy, curiosity, and problem-solving skills needed for future learning and real-world applications.

Vocabulary Progression

A critical part of progression in science is the development and accurate use of scientific vocabulary. As pupils move through the school, they are taught to use increasingly precise and technical language to describe observations, explain processes, and present conclusions. This not only supports their understanding of scientific concepts but also helps them communicate their ideas effectively and confidently.

- **In KS1**, pupils are introduced to simple descriptive words (e.g., *hot, cold, rough, smooth*) and basic scientific terms linked to enquiry (e.g., *test, observe, measure*). They begin to talk about what they see, notice patterns, and describe changes using everyday language.
- **In LKS2**, children begin to use more specific vocabulary related to scientific topics (e.g., *condensation, digestion, habitat*). They are encouraged to describe scientific processes in full sentences and to explain their observations using cause-and-effect reasoning (e.g., "The water evaporated because it was heated by the sun").
- **In UKS2**, pupils are expected to use technical scientific language with accuracy and confidence. They construct detailed written and verbal explanations, interpret and present data in various formats (e.g., graphs, tables, reports), and use vocabulary to justify their conclusions. They are also introduced to language that supports critical evaluation, such as *reliable, valid, evidence, and conclusion*.

This structured approach ensures that pupils develop the scientific literacy needed to access the curriculum at a deeper level and prepares them for the more complex language demands of secondary science.

Strand	KS1	Vocabulary	LKS2	Vocabulary	UKS2	Vocabulary
Working Scientifically	-Ask simple questions about the world around them. -Observe closely using simple equipment. -Perform simple tests and gather	question, observe, test, compare, identify, sort, group, describe, record, explain, measure	Ask relevant scientific questions and suggest ideas for investigations. Make systematic observations. Gather, record, and present data	fair test, variable, data, evidence, conclude, systematic, accurate, classify, research, predict, record	Plan and carry out scientific investigations, controlling variables. Take precise measurements. Record and present data in detailed	hypothesis, dependent variable, independent variable, control, accuracy, precision, evaluate, reliability

	data. -Record findings using drawings, tables, and basic written explanations.		in tables and bar charts. Begin to draw conclusions based on evidence.		formats. Use evidence to justify conclusions and evaluate methods.	
Plants	-Identify and name common plants. - Understand basic plant structures. Observe and describe how seeds grow.	plant, tree, flower, leaf, root, stem, petal, seed, bulb, grow, water, light, soil, sun, healthy	Identify and describe functions of plant parts. Explore plant survival needs. Investigate water transportation and lifecycle.	nutrients, reproduction, pollination, seed dispersal, lifecycle, function, photosynthesis, oxygen, carbon dioxide	Explain plant reproduction and adaptations. Describe photosynthesis. Understand the role of plants in ecosystems.	classification, microorganism, vertebrate, invertebrate, adaptation, ecosystem, biodiversity
Animals, Including Humans	-Identify and name common animals. - Group	mammal, bird, fish, reptile, amphibian, insect, body,	Understand skeletons, muscles, and digestion. Describe	skeleton, muscle, movement, digestion, stomach,	Explain the circulatory system. Understand impact of	circulatory system, heart, blood, lungs, respiration,

	animals by diet. -Identify basic parts of the human body.	head, leg, arm, hand, foot, eye, ear, nose, mouth, sense, see, hear, touch, smell, taste, diet, herbivore, carnivore, omnivore	food chains.	intestine, nutrients, food chain, predator, prey, producer	lifestyle. Describe human lifecycle.	diet, nutrients, lifestyle, drugs, puberty, reproduction
Materials/States of Matter	-Identify and name everyday materials. -Describe material properties. -Compare suitability of materials.	wood, plastic, glass, metal, rock, hard, soft, stretchy, waterproof, absorbent, transparent, opaque, bendy	Compare and group materials based on properties. Understand changes of state. Explore the water cycle. Investigate rocks.	solid, liquid, gas, evaporation, condensation, water cycle fossil, sedimentary, igneous, metamorphic,	Compare materials based on conductivity and solubility. Understand reversible and irreversible changes.	dissolve, solution, reversible, irreversible, chemical change, filter, sieve, evaporation

				permeable, impermeable, erosion		
Living Things and Habitats	Explore and compare living, dead, and never-living things. Identify habitats and describe simple food chains.	living, dead, never-living, habitat, food chain, predator, prey, environment, woodland, ocean, desert Seasonal Changes: summer, autumn, winter, spring, weather, rain, sun, snow, wind, temperature, day, night	Classify living things. Explore environmental changes. Investigate life cycles.		Classify organisms using criteria. Explain adaptations. Explore human impact on ecosystems.	classification, microorganism, vertebrate, invertebrate, adaptation, ecosystem, biodiversity

Forces and Magnets	N/A		Compare movement on different surfaces. Observe magnetic materials and attraction.	friction, push, pull, magnet, attract, repel, poles, gravity	Explain gravity. Explore air and water resistance. Understand simple mechanisms.	air resistance, water resistance, friction, mechanism, lever, pulley, gear
Light	Recognise that light is needed to see. Understand reflection and light sources.		Describe how light travels and how shadows form. Investigate shadow changes.	Light: reflection, shadow, source, transparent, translucent, opaque, mirror	Explain light traveling in straight lines. Investigate lenses, prisms, and the eye.	refraction, spectrum, prism, lens, periscope
Sound	N/A		Recognize that vibrations cause sounds. Investigate how sound travels.	vibration, pitch, volume, echo	Understand how sound moves through mediums. Investigate sound waves.	Patterns, sound waves, amplitude, frequency

Electricity	N/A		Identify electrical appliances. Build simple circuits. Understand conductors and insulators.	circuit, battery, wire, bulb, switch, conductor, insulator	Build and troubleshoot complex circuits. Understand voltage effects.	voltage, current, resistance, circuit diagram, components
Earth and Space	N/A		N/A		Describe Earth, Moon, and planetary movement. Explain day and night.	solar system, planet, orbit, rotation, axis, gravity, phases of the moon

KS1 Assessment Grid

Strand	WTS	%	EXS	%	GDS	%
Working Scientifically	Asks simple questions with support; makes basic observations.		Asks simple questions independently; uses simple equipment to observe.		Begins to suggest own questions; records findings in simple formats.	
Plants	Identifies common plants with help; describes basic parts.		Names plants; describes growth needs and plant parts.		Explains simple plant lifecycles; makes comparisons between plants.	
Animals, Including	Names some animals;		Groups animals		Explains how animals	

Humans	groups them by diet with help.		independentl y; links body parts to senses.		survive in habitats; makes simple comparisons.	
Materials/States of Matter	Identifies basic materials; describes simple properties.		Sorts materials by properties; begins to compare suitability.		Explains why materials are suited for different uses.	
Living Things and Habitats	Recognises living and non-living things with support.		Identifies habitats and simple food chains.		Describes how habitats support different organisms in detail.	

LKS2 Assessment Grid

Strand	WTS	%	EXS	%	GDS	%
Working Scientifically	Asks questions but needs		Asks relevant questions; records data in		Designs own investigations; begins to	

	help planning investigations.		tables and charts.		explain conclusions.	
Plants	Describes basic plant functions with guidance.		Explains parts of a plant and their functions; investigates lifecycles.		Explains water transport and plant adaptations in detail.	
Animals, Including Humans	Identifies skeletons and muscles but struggles with functions.		Explains the digestive system and food chains.		Makes detailed links between body systems and health.	
Materials/States of Matter	Groups materials by properties with help.		Understands changes of state and links to heating/cooling.		Explains the water cycle and reversible/irreversible changes.	
Living Things and Habitats	Identifies groups of living things with support.		Classifies vertebrates and invertebrates; understands environmental		Describes life cycles and adaptations in depth.	

			change.			
Forces and Magnets	Observes movement on surfaces but struggles with patterns.		Describes how magnets attract and repel.		Explains magnetic poles and applies knowledge to real-world examples.	
Light	Recognises light sources; describes simple reflection.		Explains shadow formation and investigates changes in shadows.		Makes links between reflection and practical uses.	
Sound	Identifies that sounds are made by vibrations.		Investigates pitch, volume, and how sound travels.		Explains patterns in sound waves using diagrams.	
Electricity	Identifies common electrical appliances.		Builds simple circuits and identifies conductors/insulators.		Troubleshoots circuits and explains how components work together.	

UKS2 Assessment Grid

Strand	WTS	%	EXS	%	GDS	%
Working Scientifically	Plans investigations but struggles with controlling variables.		Conducts fair tests; records detailed results.		Justifies conclusions with evidence and evaluates methods.	
Plants	Describes basic plant reproduction but lacks detail.		Explains photosynthesis and plant roles in ecosystems.		Makes connections between plants, the carbon	

					cycle, and biodiversity.	
Animals, Including Humans	Identifies organs but struggles with system interactions.		Explains the circulatory system and the effects of lifestyle choices.		Justifies links between diet, exercise, and long-term health.	
Materials/States of Matter	Describes material properties but struggles with application.		Explains solubility, conductivity, and reversible/irreversible changes.		Applies material science concepts to real-world technology.	
Living Things and Habitats	Classifies organisms but lacks detailed criteria.		Explains adaptations and human impact on ecosystems.		Evaluates conservation strategies and their effectiveness.	
Forces	Recognizes forces but struggles with		Explains gravity, friction, and air resistance.		Applies knowledge to real-world examples	

	explanations.				(e.g., engineering).	
Light	Describes light travel in simple terms.		Explains reflection and refraction using diagrams.		Investigates how lenses and prisms manipulate light.	
Sound	Describes sound travel but lacks depth.		Explains sound waves and how frequency affects pitch.		Applies knowledge to musical instruments and technology.	
Electricity	Builds circuits but struggles with troubleshooting.		Understands voltage effects and complex circuits.		Explains electricity in the context of engineering and innovation.	
Earth and Space	Names planets but lacks understanding of movement.		Explains the Earth's rotation and how it causes day/night.		Understands planetary orbits and models them accurately.	

Sandy Lane Primary School Science Overview

Year A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
KS1	Everyday materials	Seasonal	Animals including	Animals including		Light: Big Idea: How

	Big Idea: What is the best material to make a ball?	**Changes** Big Idea: Do all the leaves fall in Autumn?	**humans (different animal Types)** Big Idea: Do all animals need to eat meat to survive?	**humans Life Cycles** Big Idea: Can animals survive with only water?		**do we see light?**
LKS 2	**Rocks** Big Idea: Do rocks just appear?	**Animals Including Humans - skeletons, muscles, food groups, balanced diet** Big Idea:	**Animal including humans- teeth digestive systems, food chains** Big Idea: Where does food start and end ?		**States of Matter Solids , liquids gases. Water cycle** Big Idea: How does energy affect materials **?**	**Light** Big Idea: Does everything have a shadow all the time**?**

		How do we keep healthy **?**				
UK S2	**Science Slam – Sound** *Big Idea: How to best muffle sound?*	**Living Things and their habitats** Big Idea: *How can we organise the living world?*	**Animals including humans** Big Idea: *How does our body keep us alive?*			**Light and electricity** Big Idea: *Light travels in straight lines. True or false?* Big Idea: *An electrical circuit needs a power source to work. True or false?*
YEAR B						

KS1	**Living Things & Habitats** Big Idea: Do all animals live underground?		**Living Things & Habitats** Big Idea: Do all animals live underground ? Mary Anning Dinosaurs	**Plants:** Big Idea: **Can plants grow without light?**	-	**Lifecycles:** Big Idea: How do animals and plants change as they grow?
LKS 2	**Living Things and Their habitats- classification** Big Idea: All Living things need the same things to			**Plants Functions and features of plants.** Big Idea: Do all plants need to be planted ?		**Sound** Big Idea- How is sound made ? **Forces and magnets-** Big Idea: May the force be with

	survive- True or false?					you- Or is it ?
UK S2	**Earth and Space** *Why does the moon change its shape?*			**Forces** *Does the type of surface have an impact on the speed of an object?*	**Materials** *Why do we use different materials for different things?*	**Evolution and Inheritance** *What are the different perspectives of evolution?*