

SCIENCE INTENT STATEMENT

At Oldbrook First School, our aim is to provide a science curriculum that provides opportunities for investigative lessons. Children need to be exposed to a wide variety of topics that support their natural curiosity for learning. Our curriculum aims to broaden the children's scientific view of, and respect for, the world around them, whilst promoting a love of enquiry and wanting to explore new things. We want our pupils to develop a love for science that carries through into later life, instilling in them an awareness of how science is relevant in today's society. We ensure that working scientifically skills are built on and developed throughout their time here so they can begin to independently plan and carry out investigations to answer questions that puzzle them; competently use some scientific equipment to measure and record data accurately & have the necessary skills and vocabulary to confidently explain concepts & articulate their findings.

SCIENCE IMPLEMENTATION

The Science curriculum has the acquisition of key scientific knowledge as an integral part of our science lessons enabling pupils to learn, retain and use important vocabulary & to understand key concepts to then apply their scientific knowledge to investigations. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons. Each lesson will have a clear focus. Scientific knowledge and enquiry skills are developed with increasing depth and challenge as children move through the year groups. They complete investigations and hands-on activities while gaining the scientific knowledge for each unit. The sequence of lessons helps to embed scientific knowledge and skills, with each lesson building on previous learning. There is also the opportunity to regularly review and evaluate children's understanding and deal with mis-conceptions as they arise. Activities are effectively differentiated so that all children have an appropriate level of support and challenge.

SCIENCE IMPACT

Progress of pupils at Oldbrook First School is measured through a child's ability to know more, remember more and explain in more depth. This will be measured in different ways in each science topic. Key questions will be used throughout sessions to facilitate ongoing assessment & pupils progress and attainment tracked throughout their time at Oldbrook First School. Enabling pupils to determine the focus and content of investigative science as well as exciting whole school science themed days/projects will raise the profile of science. The learning environment will support pupils and staff to use technical scientific vocabulary during science and across other curriculum areas. Pupils will be confident and excited about using their science knowledge & skills, actively engaged in science lessons and curious to learn more, they will see the relevance of what they learn in science lessons to real life situations & the importance of science in the real world.

SCIENCE OVERVIEW

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Nursery *	Changes over time/myself my family, growing...baby – adult, comparing changes Autumn season	Owl life cycle Observing owls; their features, where they live, what they eat Night/day – nocturnal animals Light and dark – comparing light sources	Arctic-comparison between there and home Arctic animal information Ice experiments – making ice, observing it melt over time, investigating places to melt ice quickly Winter season	Weather and water cycle Life cycle of a swan Investigating and exploring floating and sinking Spring season	Growing beanstalks – planting seeds and observing them grow Naming parts of a plant – roots, stem, leaf, flower, petal Healthy Me-nurse and dentist visit Spring/Summer season	Farm/seaside comparison Sorting animals Observing minibeasts Summer season
Reception*	Experimenting with colour mixing Making rainbows Exploring & investigating magnetism	Space/planets Famous astronauts Making Alien Slime Making simple electric circuits Autumn	Forest trail – what do you see? Texture Gruffalo – exploring materials Gruffalo cook book – changes Gruffalo map and animal homes Winter season	Frog/Duckling life cycle Dinosaurs-timeline Spring season	World map- bears from around the world, their home & how they survive Features of a bear	Vegetables-healthy eating and how it helps us grow Growing veg- from seeds/from cuttings Foods from around the world
Year 1	<p>Plants Skills- Asking questions, observing, identifying and classifying.</p> <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees including changes over time.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees – plant beans & observe growth over time.</p> <p>Observe and describe weather associated with the seasons and how day length varies. (To experience Autumn) Seasonal changes (To experience Autumn – take photos of trees in the school grounds)</p>	<p>Materials Skills- performing simple tests & recording</p> <p>Distinguish between an object & the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. 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. Perform tests- hard/soft; stretchy/stiff; rough/smooth; bendy/not bendy; opaque/transparent observe and describe</p> <p>weather associated with the seasons and how day length varies. (To experience winter– take photos of trees in the school grounds)</p>	<p>Humans and Senses Skills – Noticing patterns, do the tallest people have the biggest feet etc.</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>Seasonal changes</p>	<p>Materials Skills - questioning, performing simple tests and recording.</p> <p>Re-cap previous materials work.</p> <p>Test materials for waterproof/not waterproof; absorbent/not absorbent; floats/sinks.</p> <p>Use the results of testing to choose materials and shapes to make a boat.</p> <p>Observe and describe weather associated with the seasons and how day length varies. (To experience Spring– take photos of trees in the school grounds)</p>	<p>Animals Skills- predicting, sorting, identifying, classifying, gathering & presenting data</p> <p>Identify and name a variety of common animal groups 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>Explore and answer questions about animals in their habitats within the local environment.</p> <p>Understand how to take care of animals and return safely after study.</p>	<p>Animals Skills- observing & measuring changes, noticing patterns</p> <p>Re-cap animals work covered.</p> <p>Identify & humanly constructed features & natural features in the school grounds.</p> <p>Investigate where most animals will be found in school grounds (natural spaces/humanly constructed spaces?). Predict then collect data.</p> <p>Observe and describe weather associated with the seasons and how day length varies. (To experience Summer– take photos of trees in the school grounds) Compare the photos of the trees taken over the course of the year.</p>

<p>Year 2</p>	<p>Materials Skills – recording/collating & presenting data, making predictions, sorting & classifying, identify what to change/keep the same for a fair test. Identify and compare the suitability of a variety of everyday materials for particular uses. Predict then develop a fair test to see which materials burn – which would you use to build a house to prevent a fire? Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Explore how materials can be changed by heating/cooling & identify which are reversible/irreversible (toast, ice etc.)</p>	<p>Investigations Skills – asking questions & recognising that they can be investigated in different ways, identify what to change/keep the same for a fair test, recording results. What happens when you mix different solids with water? Which brick builds the best tower? Do all liquids freeze? Where is the best place to grow cress? What happens when you mix different liquids?</p>	<p>Making Observations Skills – observing what happens, noticing cause and effect What is gravity? Observe what happens when dropping objects – do they all fall downwards? Relate to Isaac Newton Moving objects – which force causes the movement? (push, pull, gravity etc.) Observe bubbles, why is there a rainbow? Explore bending light to create rainbows. Who uses telescopes? Why? Relate to Tim Peak.</p>	<p>Living Things and Their Habitats Skills – sorting & classifying, noticing patterns, presenting data, drawing conclusions. Explore and compare the difference 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 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 micro-habitats. 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>Animals including Humans Understand that animals, including humans, have offspring which grow into adults – match off spring to adult. Use secondary sources to find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Use secondary sources to find out and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Consider carefully completed mould test)</p>	<p>Plants Re-cap cress investigation and describe how seeds and bulbs grow into mature plants – draw a simple life cycle. Plan and carry out some investigations with plants to reinforce that plants need water, light and a suitable temperature to grow and stay healthy. Some seedlings in dark/light Some seedlings in cold/warmth Some seedlings with water/no water etc. Investigate will plants only grow with water to 'drink'?</p>
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*rolling 2year planning cycle across the FS

CULTURAL CAPITAL OVERVIEW

Within our science curriculum this ‘Science capital’ encompasses all the science related knowledge, attitudes, experiences & resources acquired including the science you know, how you think about science and who you know in science – all aspects are linked and overlap.

	Scientific Literacy	Scientific values	People and science	Science in the news	Out of school science*	Science is everywhere
EYFS	There will be a ‘sliding’ progressive system for building on scientific vocabulary. In the early stages new vocabulary will be introduced and modelled to pupils alongside familiar language, pupils will be encouraged to use the scientific vocabulary that they know and understand until they are choosing to use it independently in an appropriate way in a relevant context.	Through play and exploration pupils will begin to develop a love of science as they are exposed to a wide range of resources and activities. They will be curious about why things happen and how things work.	Pupils will develop an understanding that science is used in some occupations (visits from nurse, dentist etc) & celebrate scientists within their family (older siblings’ parents etc.)	Look at science themed ‘news flash’ on espresso /relevant videos that relate to topics as they are taught.	Curriculum newsletters inform parents of the science being covered each term. Where appropriate include a fun science activity that can be shared at home. Possible trips with a scientific focus – farm, zoo, safari park, local areas, museums etc.	Pupils will begin to appreciate and understand that science is happening everywhere around them. Staff will exploit opportunities to talk about the incidental science that is happening through play/everyday occurrences, pupils’ interests will be used to lead investigations to foster their curiosity and motivate them to find out more.
KS1		Using pupils existing enthusiasm for science and finding out ‘why?’ they will be exposed to more structured & systematic investigations/research.	Continue to celebrate family scientists and broaden knowledge of science in jobs – as appropriate invite visitors in to talk to pupils. Research famous scientists, arrange to have virtual meetings with scientists.	Continue to look at science themed ‘news flash’ on espresso /relevant videos that relate to topics as they are taught, begin to use a wider source of information (internet, social media, newspapers, magazines etc.)	Curriculum newsletters inform parents of the science being covered each term. Where appropriate include a fun science activity that can be shared at home. Celebrate any external science clubs etc pupils attend. Trips with a scientific focus - farm, zoo, safari park, local habitats, museums, science labs etc.	

*Year groups to add specific trips

SCIENCE PROGRESSION OF SKILLS

	Early Years Foundation Stage	Year One	Year Two	Next Steps
Asking questions & carrying out Fair & Comparative Tests	<p>Understand simple questions about 'who', 'what' and 'where' (but generally not 'why').</p> <p>Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"</p> <p>Ask questions to find out more and to check they understand what has been said to them.</p>	<p>Asking simple questions and recognising that they can be answered in different ways.</p> <p>Performing simple tests children can:</p> <ul style="list-style-type: none"> explore the world around them, leading them to ask some simple scientific questions about how and why things happen; carry out simple practical tests, using simple equipment; Begin to recognise when a test is not fair & with support talk about changes to improve fairness. 	<p>Asking simple questions and recognising that they can be answered in different ways.</p> <p>Performing simple tests children can:</p> <ul style="list-style-type: none"> begin to recognise ways in which they might answer scientific questions; ask people questions and use simple secondary sources to find answers; experience different types of scientific enquiries, including practical activities; talk about the aim of scientific tests they are working on; Begin to recognise a fair test and suggest one thing to change & some things which must be the same 	<p>Asking relevant questions and using different types of scientific enquiries to answer them to;</p> <ul style="list-style-type: none"> start to raise their own relevant questions about the world around them in response to a range of scientific experiences; start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a fair test is necessary; help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used & carry out simple comparative and fair tests.
Observing & Measuring Changes	<ul style="list-style-type: none"> Repeat actions that have an effect Explore how things work Explore and talk about different forces they can feel. Compare length, weight and capacity. 	<p>Observing closely, using simple equipment children can:</p> <ul style="list-style-type: none"> observe the world around them identifying natural and humanly constructed aspects observe changes over time; use simple measurements and equipment with support 	<p>Observing closely, using simple equipment children can:</p> <ul style="list-style-type: none"> Describe and talk about the similarities/differences in natural/humanly constructed aspects of the world around them make careful observations, sometimes using equipment to help them observe carefully. Observe & measure changes over time; use simple measurements and equipment 	<p>Making systematic and careful observations 'now' & over time, where appropriate, taking accurate measurements using standard units, using a range of equipment including thermometers and data loggers</p>
Identifying, Classifying & Presenting Data	<ul style="list-style-type: none"> Identify and name some animals, objects and plants, with support begin to sort into groups with similar characteristics/features Sorting objects, animals & plants by simple features/characteristics Observe modelling of data recording 	<p>Gathering and recording data to help in answering questions children can:</p> <ul style="list-style-type: none"> Use simple features to compare objects, materials and living things; Decide how to sort and classify objects into simple groups with some help; Record and communicate findings in a range of ways with support 	<p>Gathering and recording data to help in answering questions children can:</p> <ul style="list-style-type: none"> Use more complex features to compare and describe objects, materials and living things; Decide criteria for sorting and classifying objects into groups – begin to use scientific vocabulary in their sorting & classifying Gather and record data in a variety of ways to help in answering questions such as in 	<p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions children can;</p> <ul style="list-style-type: none"> Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Talk about criteria for grouping, sorting and classifying; Collect data from their own observations and measurements;

			simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.	<ul style="list-style-type: none"> Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.
Drawing Conclusions, Noticing Patterns & Presenting Findings	<ul style="list-style-type: none"> Talk about what they see, using a wide vocabulary. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results & conclusions. 	Using their observations and ideas to suggest answers to questions children can: <ul style="list-style-type: none"> Identify links between cause and effect with support; begin to identify patterns and relationships to draw simple conclusions with support; use simple and scientific language to talk about their findings; 	Using their observations and ideas to suggest answers to questions children can: <ul style="list-style-type: none"> Explain the links between cause and effect with support; begin to describe/explain patterns and relationships to draw simple conclusions; Identify and discuss differences between their results; Use scientific vocabulary to write about their findings Talk about their findings to a variety of audiences in a variety of ways. 	Using their observations and ideas to suggest answers to questions children can: <ul style="list-style-type: none"> draw simple conclusions from their results; make predictions; suggest improvements to investigations; raise further questions which could be investigated; Talk about, and then go on to report and present their results and conclusions to others in written and oral forms with increasing confidence.
Vocabulary Working Scientifically	General Enquiry: Questions, answers, equipment, results, sort, predict, explore, observe, similar, similarities, collect, measure, record, group, test, compare, describe, different, differences, evidence, data, table, chart, classify, identify, observe changes of time, notice patterns, notice relationships, secondary sources, communicate, pictogram, tally chart, block diagram / graph, gather, order, link ideas, Venn diagram, rank Use comparatives – hotter/ cooler, older / younger etc Equipment specific: Egg timers, ruler, tape measure, metre stick, beaker, hand lenses, stop watch, pipette, syringe, beaker, measuring cylinder, scale			

SCIENCE PROGRESSION OF KNOWLEDGE

	Early Years Foundation Stage	Year One	Year Two	Next Steps
Plants	<p>Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Y3 Pupils should be taught to:</p> <ul style="list-style-type: none"> 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
Vocabulary	<p>Names of locally found garden plants / wild plants / flowering plants / trees, name of plants/vegetable grown Leaf / leaves, flower, blossom, petal, fruit, berry, vegetable, root, bulb, seed, trunk, branch, stem, stalk Wild plants, Garden plants, Flowering plants, Deciduous, Evergreen, Seedling, Shoot, Fully grown, Growth, Healthy, Wither, Soil, Earth, Water, Light, Hot/cold, Nutrients, Mature plant, Temperature, Germinate / germination, Pollination, Seed dispersal</p>			
Animals Including Humans	<p>Notice differences between people. Continue to develop positive attitudes about the differences between people. Make healthy choices about food, drink, activity and toothbrushing Understand the key features of the life cycle of an animal. Know and talk about the different factors that support their overall health and wellbeing:</p> <ul style="list-style-type: none"> regular physical activity healthy eating toothbrushing sensible amounts of 'screen time' having a good sleep routine being a safe pedestrian 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Y3 Pupils should be taught to:</p> <ul style="list-style-type: none"> 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
Vocabulary	<p>Names of common animals – fish, birds etc. Grow, Adult, Young, Baby, Toddler, Child, Teenager, Offspring, Meat-eaters, Plant feeders, Amphibians Reptiles Mammals Carnivores Herbivores Omnivores, Habitat, Wild animals, Pets, Senses, Hear/hearing, See/seeing, Touch / touching, Taste/tasting. Body parts: Mouth, Head, Body, Neck, Arms, Eyebrows, Eyelashes, Legs, Elbows, Knees, Face, Eyes, Ears, Teeth, Reproduction, Life cycle, Heart rate, Nutrition Animal features: Wing, Claw, Tail, Beak, Fur, Feather, Fin, Scales. Survival Basic needs – water, food, air. Food types – name common e.gs, Hygiene, Infection, Exercise, Unhealthy, Develop,</p>			
Living Things & their habitats	<p>Explore and respond to different natural phenomena in their setting and on trips Begin to understand the need to respect and care for the natural environment and all living things. Explore the natural world around them. Describe what they see, hear and feel whilst outside.</p>		<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> explore and compare the difference 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 	<p>Y4 Pupils should be taught to:</p> <ul style="list-style-type: none"> 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

	<p>Recognise some environments that are different to the one in which they live. Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps. 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</p>		<p>provide the basic needs of different kinds of animals and plants, and how they depend on each other</p> <ul style="list-style-type: none"> identify and name a variety of plants and animals in their habitats, including micro-habitats 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>environment</p> <ul style="list-style-type: none"> recognise that environments can change and that this can sometimes pose dangers to living things
Vocabulary	<p>Living , Alive , Non-living, Dead, Move , Grow, Feed, Breathe , Have young, Needs , Shelter, Heat , Habitats, Conditions, Characteristics, Adaptation, Food chain, Name micro-habitats – log, bush, Describes conditions – damp, dark etc , Food, chain, Carnivore, Herbivore, Omnivore, Name local habitats – pond, woodland , Life processes, Reproduce, Respire, Excrete , Producer, Consumer, Sources of food, Seashore, Ocean, Rainforest , Micro-habitat, Conditions , Depends on/suited to</p>			
Seasonal Change	<p>Understand the effect of changing seasons on the natural world around them.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies 		
Vocabulary	<p>Season, Autumn, Winter, Spring, Summer, Names of days/months, hours, minutes, time Weather, rain, cloud, sun, snow, hailstones, storm, wind, hot, cold, hibernate, nocturnal, Light, Dark , Shadow, Moon , Movement, Day length</p>			
Materials	<p>Explore materials with different properties. Explore natural materials, indoors and outside. Use all their senses in hands on exploration of natural materials Explore collections of materials with similar and/or different properties. Explore how things work Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.</p>	<p>Everyday Materials Pupils should be taught to:</p> <ul style="list-style-type: none"> distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock 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 	<p>Uses of Everyday Materials Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Rocks Y3 Pupils should be taught to:</p> <ul style="list-style-type: none"> 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
Vocabulary	<p>Object, Material, Wood, Plastic, Glass, Metal, Solid, Liquid, Gas, Bendy, Stiff, Soft, Hard, Squashing, Stretching, See through, Textures (describing words for different textures), Reflection, Properties, Transparent, Man-made, Natural , Describe features of change – pushing / pulling, Suitable, Use / useful, Characteristics, Properties, Rigid, Flexible, Strong, Weak, Reflective, Non-reflective, Transparent, Opaque, Translucent, Shape, Changes, Suitability , purpose</p>			

EYFS – blue type = birth to 3, green type = 3 & 4 year olds, black type = YR & bold type = ELG