

Science Curriculum Progression

Implementation

- Science is a core subject and as such is given discrete weekly curriculum time in each class.
- Our Science curriculum is sequenced in a coherent manner to allow children to progress through the EYFS and primary phase, building on prior skills and knowledge.
- Throughout the curriculum, lessons are carefully planned to enable the children to develop their scientific understanding of concepts (substantive knowledge) and to allow them to develop the skills of Scientific Enquiry (disciplinary knowledge).
- Practical activities have clear intentions and are well-thought out.

Meeting the needs of all children

Our Science curriculum is inclusive and accessible - all of our children achieve their potential in Science. Pupils who may find other curriculum areas challenging have the opportunity to excel in this area of the curriculum. Children are encouraged to be independent in their learning and to have a thirst to do well. New knowledge is broken down into meaningful components and introduced sequentially. This supports all children when learning scientific concepts and developing the skills of scientific enquiry. Science learning outcomes are not always recorded in a written format, which can often remove a barrier for our disadvantaged children. Children may work in groups to explore ideas and complete practical activities to support their learning and give them access to positive role models. Our enriched curriculum (including STEM club, visitors and class visits) gives our more disadvantaged children the opportunity to increase their vocabulary and develop their Science Capital.

Curriculum Design and Coverage

Early Years:

Pupils will explore:

Understanding the world

People and communities: children talk about past and present events in their own lives and in the lives of family members. They know that other children don't always enjoy the same things, and are sensitive to this. They know about similarities and differences between themselves and others, and among families, communities and traditions.

The world: children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.

Key Stage 1

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them.

Children will learn to work scientifically through their study of the following topics during their time in Key Stage 1 and linked to the National Curriculum objectives:

Plants; Animals, including humans; Everyday materials; Seasonal changes; and Living things and their habitats.

Lower Key Stage 2

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions.

Children will continue to learn to work scientifically through their study of the following topics during their time in Lower Key Stage 2 and linked to the National Curriculum objectives:

Plants; Animals, including humans; Rocks; Light; Forces and magnets; Living things and their habitats; States of matter; Sound; Electricity.

Upper Key Stage 2

Children will continue to learn to work scientifically through their study of the following topics during their time in Upper Key Stage 2 and linked to the National Curriculum objectives:

Animals, including humans; Light; Forces; Living things and their habitats; Electricity; Properties of materials; Earth and Space; Evolution

EYFS

Science in the EYFS focuses on the development area of Understanding of the World. In the EYFS, children are given opportunities throughout the year within their continuous provision to explore, ask and answer questions about the world around them. Children will have the opportunity to explore the natural world through our Forest School provision.

In the EYFS, Understanding of the World is developed throughout the year and revisited in line with children's interests and learning needs. Planning is flexible and where links can be made to the wider world, discussions of space, place and people should be made.

Understanding the world involves guiding children to make sense of their physical world. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them. In addition, listening to a broad selection of stories and non-fiction will foster their understanding of our ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across areas. Enriching and widening children's vocabulary will support later reading comprehension.

Working Scientifically

EYFS, 1,2,3,4,5,6.

Pre-school	Choose the right resources to carry out their own plan. For example, choosing a spade to enlarge a small hole they dug with a trowel. (PD)	Make comparisons between objects relating to size, length, weight and capacity. (M)	Explore how things work. (UW)			
Reception	Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons. (PD)	Compare length, weight and capacity. (M) Understand the 'one more than/one less than' relationship between consecutive numbers. (M)	Continue, copy and create repeating patterns. (M)	Return to and build on their previous learning, refining ideas and developing their ability to represent them. (EAD)	<i>(ELG) Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate. (CAL)</i>	<i>(ELG) Make comments about what they have heard and ask questions to clarify their understanding. (CAL)</i>
Working Scientifically Years 1 and 2	I can ask simple questions and recognise that they can be answered in different ways.	I can identify and classify.	I can gather and record data to help in answering questions.	I can use my observations and ideas to suggest answers to questions	I can perform simple tests.	I can observe closely, using simple equipment.
Working Scientifically	I can ask relevant questions and use different types of	I can set up simple practical enquiries, comparative and fair tests.	I can make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using			

Years 3 and 4	scientific enquiries to answer them.		a range of equipment, including thermometers and data loggers			
Working Scientifically Years 3 and 4	I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	I can identify differences, similarities or changes related to simple scientific ideas and processes	I can use straightforward scientific evidence to answer questions or to support their findings.			
Working Scientifically Years 5 and 6	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	I can use test results to make predictions to set up further comparative and fair tests	I can report and present 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	I can identify scientific evidence that has been used to support or refute ideas or arguments.

Electricity

4 & 6.

Electricity Year 4	I can identify common appliances that run on electricity	I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	I can 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	I recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	I recognise some common conductors and insulators, and associate metals with being good conductors.	
Electricity Year 6	I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	I can 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	I can use recognised symbols when representing a simple circuit in a diagram.			

Seasonal Changes

EYFS, Year 1

Nursery	Talk about what they see, using a wide range of vocabulary.					
Reception	Understand the effect of changing seasons on the natural world around them. (UW) <i>(ELG) Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. (UW)</i>	Explore the natural world around them.	Describe what they see/hear and feel whilst outside.			
Seasonal Changes Year 1	I have observed changes across the four seasons	I have observed and described weather associated with the seasons and how day length varies.				



Living Things and their habitats

EYFS,2,4,5,6.

Nursery	Understand the key features of the life cycle of a plant and an animal. (UW)	Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. (EAD)	.	
Reception	Describe what they see, hear and feel whilst outside. (UW) <i>(ELG) Explore the natural world around them, making observations and drawing pictures of animals and plants. (UW)</i>	Recognise some environments that are different to the one in which they live. (UW) <i>(ELG) 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. (UW)</i>	<i>(ELG) Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps. (UW)</i>	
Living things and their habitats Year 2	I can explain what is living, what is dead and what has never been alive. I can sort and group things I find in a habitat according to whether it is living dead or never been alive.	I know that most living things live in habitats to which they are suited and I can describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other	I can identify and name a variety of plants and animals in their habitats, including microhabitats	I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and I can identify and name different sources of food.

Living things and their habitats Year 4	I know that that living things can be grouped in a variety of ways	I have explored and used classification keys to help group, identify and name a variety of living things in the local and wider environment	I know that environments can change and that this can sometimes pose dangers to living things.	
Living things and their habitats Year 5	I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	I can describe the life process of reproduction in some plants and animals.		
Living things and their habitats Year 6	I am able to describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals	I can give reasons for classifying plants and animals based on specific characteristics.		

Earth and Space

Year 5

Earth and Space Year 5	I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system	I can describe the movement of the Moon relative to the Earth	I can describe the Sun, Earth and Moon as approximately spherical bodies	I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.		

Animals Including Humans

EYFS, 1,2,3,4,5,6.

Pre-school	Be increasingly independent in meeting their own care needs, e.g. brushing teeth, using the toilet, washing and drying their hands. (PSED)	Talk about what they see, using a wide vocabulary. (UW)	Use all their senses in hands-on exploration of natural materials. (UW)	Use large-muscle movements to wave flags and streamers, paint and make marks. (PD)	Use large-muscle movements to paint and make marks. (PD)	
Reception	Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian. (PSED)	Explore the natural world around them. (UW)	Explore the natural world around them. (UW) <i>(ELG) Explore the natural world around them, making observations and drawing pictures of animals and plants. (UW)</i>	Describe what they see, hear and feel whilst outside. (UW)	Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity. (PSED)	Manage their own needs. - Personal hygiene (PSED) <i>(ELG) Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. (PSED)</i>
Animals including Humans Year 1	I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	I can identify and name a variety of common animals that are carnivores, herbivores and omnivores	I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.		

Animals including Humans Year 2	I know that animals, including humans, have offspring which grow into adults	I know about and can describe the basic needs of animals, including humans, for survival (water, food and air)	I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.			
Animals, including humans Year 3	I know 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	I know that humans and some other animals have skeletons and muscles for support, protection and movement.				
Animals including Humans Year 4	I can describe the simple functions of the basic parts of the digestive system in humans	I can identify the different types of teeth in humans and their simple functions	I can construct and interpret a variety of food chains, identifying producers, predators and prey.			
Animals including Humans Year 5	I describe the changes as humans develop to old age.					
Animals including Humans Year 6	I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	I recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	I can describe the ways in which nutrients and water are transported within animals, including humans.			

Sound

EYFS, Year 4

Nursery	Increasingly be able to use and remember sequences and patterns of movements which are related to music and rhythm. (PD)	Listen with increased attention to sounds. (EAD) Remember and sing entire songs. (EAD)	Respond to what they have heard, expressing their thoughts and feelings. (EAD)	Sing the pitch of a tone sung by another person ('pitch match'). (EAD)	Create their own songs or improvise a song around one they know. (EAD)	Play instruments with increasing control to express their feelings and ideas. (EAD)
Reception	<ul style="list-style-type: none"> Listen attentively, move to and talk about music, expressing their feelings and responses. (EAD) 	Watch and talk about dance and performance art, expressing their feelings and responses. (EAD)	Sing in a group or on their own, increasingly matching the pitch and following the melody. (EAD)	Explore and engage in music making and dance, performing solo or in groups. (EAD)		
Sound Year 4	I know how sounds are made, associating some of them with something vibrating	I recognise that vibrations from sounds travel through a medium to the ear	I can find patterns between the pitch of a sound and features of the object that produced it	I can find patterns between the volume of a sound and the strength of the vibrations that produced it	I recognise that sounds get fainter as the distance from the sound source increases.	

Evolution and Inheritance

Year 6

Evolution and inheritance Year 6	I recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	I recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.			

Materials including Rocks, States of Matter and Properties and Changes in Materials

EYFS, 1,2,3,4,5.

Nursery	Make comparisons between objects relating to size, length, weight and capacity. (M)	Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. (M)	Explore different materials freely, to develop their ideas about how to use them and what to make. (EAD) Develop their own ideas and then decide which materials to use to express them. (EAD) Join different materials and explore different textures. (EAD)	Explore collections of materials with similar and/or different properties. (UW)	Talk about the differences between materials and changes they notice. (UW)	
Reception	<i>(ELG) Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. (UW)</i>					
Everyday Materials Year 1	I can distinguish between an object and the material from which it is made	I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock	I can describe the simple physical properties of a variety of everyday materials	I can compare and group together a variety of everyday materials on the basis of their simple physical properties.		
Uses of everyday materials	I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass,	I have investigated how the shapes of solid objects made from some materials can be changed by				

Year 2	brick, rock, paper and cardboard for particular uses	squashing, bending, twisting and stretching.				
Rocks Year 3	I have compared and grouped together different kinds of rocks on the basis of their appearance and simple physical properties	I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. I know that soils are made from rocks and organic matter.				
States of Matter Year 4	I can compare and group materials together, according to whether they are solids, liquids or gases	I know that some materials change state when they are heated or cooled, and can measure or research the temperature at which this happens in degrees Celsius (°C)	I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.			
Properties and Changes in Materials Year 5	I can 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	I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	I can use my knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	I can demonstrate that dissolving, mixing and changes of state are reversible changes	I can 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.

Plants

EYFS, 1,2,3.

Nursery	Plant seeds and care for growing plants. (UW)	Begin to understand the need to respect and care for the natural environment and all living things. (UW)				
Reception	<i>(ELG) Explore the natural world around them, making observations and drawing pictures of animals and plants. (UW)</i>					
Plants Year 1	I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	I can identify and describe the basic structure of a variety of common flowering plants, including trees.				
Plants Year 2	I have observed and can describe how seeds and bulbs grow into mature plants	I have investigated and can describe how plants need water, light and a suitable temperature to grow and stay healthy.				
Plants Year 3	I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	I have explored the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how	I have investigated the way in which water is transported within plants	I have explored the part that flowers play in the life cycle of flowering plants, including pollination, seed		

		they vary from plant to plant		formation and seed dispersal.		
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Forces (and magnets)

EYFS, 3 & 5.

Nursery	Talk about what they see, using a wide vocabulary. (UW)	Explore and talk about different forces they can feel. (UW)				
Reception	Explore the natural world around them (UW)	Describe what they can see/hear/feel whilst outside. (UW)				
Forces and Magnets Year 3	I have compared how things move on different surfaces	I know that some forces need contact between two objects, but magnetic forces can act at a distance. I have seen how magnets attract or repel each other and attract some materials and not others	I have compared and grouped together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identified some magnetic materials	I can predict whether two magnets will attract or repel each other, depending on which poles are facing.		
Forces Year 5	I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces	I know that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.			

Light

EYFS, 3 & 6.

Pre-school	Talk about what they see, using a wide vocabulary. (UW)					
Reception	Describe what they see/hear/feel whilst outside. (UW)	Explore the natural world around them (UW)				
Light Year 3	I know that I need light in order to see things and that dark is the absence of light	I know that light is reflected from surfaces	I know that light from the sun can be dangerous and that there are ways to protect my eyes	I can explain that shadows are formed when the light from a light source is blocked by an opaque object. I have found patterns in the way that the size of shadows changes.		
Light Year 6	I recognise that light appears to travel in straight lines	I can 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	I can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes	I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.		

Assessing Science

- Pupils will be assessed on their subject knowledge, skills and application against our planned curriculum.
- Attainment judgements will be made against a range of evidence including – written/printed evidence, teacher/pupil discussions, conferencing and self or peer reflections.
- Teachers ensure prior knowledge and previous learning goals are secure before moving on to new content.
- There are planned opportunities for retrieval of knowledge and skills.
- End of unit assessment tasks are used to assess the acquisition of skills and knowledge against the curricular goals for the unit of work.
- There will be opportunities for children to demonstrate new learning and learning over time.
- Teacher Assessment in Primary Science (TAPS) activities are used to support teacher assessment
- After assessments are carried out, attainment is recorded on Insight
- Review of Medium-Term Plans support teachers to know what areas have been secured and how the attainment of the children impacts on future planning.

Impact

The successful approach to the teaching of Science at Starcross Primary School will result in a fun, engaging and high-quality Science Education that provides children with the foundations for understanding the world that they can take with them once they complete their primary education.

At Starcross, all children, regardless of need or barrier will:

- demonstrate a love of Science and an interest in further study and work in this field
- retain knowledge that is pertinent to Science with a real-life context.
- be able to question ideas and reflect on knowledge.
- be able to articulate their understanding of scientific concepts and be able to reason scientifically using rich language linked to Science.
- demonstrate a high level of mathematical skills through their work in organising, recording and interpreting results.
- work collaboratively and practically to investigate and experiment.

- achieve age related expectations in Science at the end of their cohort year.