



Freegrounds Infant School

'Building the future together'

Intent

At Freegrounds Infant School, we will provide our children with the skills, knowledge and empathy they need to become successful, creative and curious learners. We want our children to develop their ability to ask questions, collect information, organise and test their ideas, solve problems, and apply what they learn. Through quality first teaching we will provide children with opportunities to develop and practice communication skills, collaborative skills, teamwork and perseverance, as well as analytical, critical and reasoning skills. The children will have not only, the fundamental scientific knowledge and skills to navigate everyday life, but also to forge careers as scientists in a variety of fields.

Implementation

The National Curriculum is the starting point for the teaching of all subjects in our school. Statutory requirements are carefully mapped across a two-year cycle, ensuring that skills and knowledge are taught in an order that makes sense. We feel it is important to expand our curriculum, offering to explore the local environment within which our schools are situated as well as providing opportunities to explore aspects of science that we feel might be of interest to our children. We have carefully thought about how scientific knowledge and skills can be sequenced to maximise cross-curricular learning opportunities whilst allowing children to build on their prior learning and experiences.

A positive attitude to science learning is promoted within classrooms, reinforcing an expectation that all children are capable of achieving high standards in science. Through our planning, we ensure there are problem-solving opportunities that allow children to investigate and explore scientific procedures and techniques. Our children are encouraged to ask their own questions, and they are given opportunities to use their science knowledge and research skills to discover the answers. When planning, teachers create engaging lessons using a range of resources to aid understanding. We build upon the learning and skill development of the previous years, therefore developing a depth of understanding and progression of skills. As children progress through school, they will explore, question, predict, plan, carry out investigations and observations as well as conclude their findings. As their knowledge and understanding increase, the children become increasingly confident in their growing ability to plan their own investigations, basing conclusions on evidence and their findings. Scientific skills are embedded into lessons to ensure these are being developed throughout the children's school career, with new vocabulary and challenging concepts introduced through direct teaching. Where possible, science is linked to topics and learning journeys that the children undertake as well as opportunities linked to real-life problems to solve.

Assessment is continuous to monitor progress and identify any support (or increased challenge) that might be required. We have high ambitions for every pupil, particularly SEND, disadvantaged and vulnerable pupils. Where needed, lessons are differentiated to ensure that children who need further support have appropriate resources and scaffolding to enable them to successfully access the learning. Pupils that require further challenge will be encouraged to think more deeply about the learning, making connections with their own lives and offering their own opinions based on their findings. Summative assessment is based on a progression of skills and knowledge as per the table on page 4 of this document. As with all areas of learning, we will regularly review, reflect upon and evaluate our science curriculum to ensure that it meets the needs of all the children in our school.

Impact

The planning and teaching of our curriculum ensures that when children leave infant school, they have the scientific knowledge and skills they need to transition successfully to junior school. Pupils will understand how science is relevant to everyday life, they will have the foundations to make a positive contribution to society and be confident in their own abilities and proud of their achievements. Our engagement with the local environment ensures that children learn through varied and first-hand experiences of the world around them and have the knowledge to care for its natural beauty. Through various workshops, trips and interactions with experts, our science curriculum will lead our children to be enthusiastic learners, and by building resilience and independence, our pupils will achieve highly and be ready to make valuable contributions to our ever-changing and diverse world.



Freegrounds Infant School: Science Curriculum Map

A	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Yr 1 & 2	How do I get home?		The Sea		Save the planet	
	Seasonal Change Observe & describe weather associated with the seasons and observe changes across the four seasons.	Seasonal Change (Winter) Observe & describe weather associated with the seasons and observe changes across the four seasons.	Habitats Living things and their habitats Explore and compare things that are living, dead and never been alive	Seasonal Change (Spring) Observe & describe weather associated with the seasons and observe changes across the four seasons.	Seasonal Change (Summer) Observe & describe weather associated with the seasons and observe changes across the four seasons.	Animals Fish, amphibians, reptiles, birds & mammals Carnivores, herbivores, & omnivores Food chains
B	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Yr 1 & 2	Let it shine...	Winter	What big eyes you've got!	Let it grow!	Kings and Queens	I spy...
	Materials Exploring different types of material and how materials can change + comparing materials suitability for different uses	Materials Exploring different types of material and how materials can change + comparing materials suitability for different uses	Animals Identifying, & labelling the basic parts of the body Offspring + basic needs of animals Importance of exercise, nutrition & hygiene	Plants Identifying & naming plants + describing basic structure of common flowering plants & trees Growing plants, observing, describing and finding out what plants need to grow healthily		Habitats Living things and their habitats Explore and compare things that are living, dead and never been alive

NB: See EYFS Curriculum map to see how learning in EYFS feeds into the whole school curriculum map for science

		Key Stage 1	
		Year 1	Year 2
DISCIPLINARY KNOWLEDGE	Asking questions	Is beginning to be curious and ask simple questions	- Can ask simple questions and recognise that they can be answered in different ways. - Can use simple secondary sources to find answers to questions
	Planning & carrying out investigations	Can follow a set instructions accurately	Can carry out simple tests, following given instructions accurately
	Observing & measuring	Can use simple equipment such as hand lenses and egg timers to make observations	Can make careful observations using simple equipment such as egg timers and hand lenses and talk about what they have found out
	Recording	Is beginning to record and communicate findings in a variety of ways e.g. using pictures, photographs, simple sentences	- Can gather and record data to help in answering questions - Can record and communicate their findings in a range of ways, beginning to use simple scientific language
	Interpreting and reporting	Can say what is the same and what is different about a given set of objects, materials or living things	- Can identify and classify objects, materials and living things - Can compare, sort and group objects, materials and living things, beginning to notice patterns and relationships
	Evaluate	Can verbally discuss the results and findings of a group investigation	- Can use their observations and ideas to suggest answers to scientific questions - Is beginning to consider what (if anything) might have made their investigation better

SUBSTANTIVE KNOWLEDGE	Animals including humans	- 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 - Can identify and name a variety of common animals that are carnivores, herbivores and omnivores - Can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals - Can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds a	- Notices that animals, including humans, have offspring which grow into adults - Can describe the basic needs of animals, including humans, for survival (water, food and air) - Understands the importance for humans of exercise, eating the right amounts of different types of food, and hygiene
	Plants	- Can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - Can identify and describe the basic structure of a variety of common flowering plants, including trees	- Can observe and describe how seeds and bulbs grow into mature plants - Can describe how plants need water, light and a suitable temperature to grow and stay healthy
	Living things & their habitats		- Can compare the differences between things that are living, dead, and things that have never been alive - Can 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 - Can identify and name a variety of plants and animals in their habitats, including microhabitats - Can 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
	Materials	- Can distinguish between an object and the material from which it is made • Can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock - Can describe the simple physical properties of a variety of everyday materials - Can compare and group together a variety of everyday materials on the basis of their simple physical properties	- Can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses - Understands how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
	Seasonal Change	- Can explain changes across the 4 seasons - Can describe weather associated with the seasons and how day length varies	



Freegrounds Infant School: Science Areas of Study (Substantive knowledge)

YEAR 1 & 2 – Cycle A	YEAR 1 & 2 – Cycle B
Seasons - Observe changes across the four seasons - Observe and describe weather associated with the seasons and how day length varies.	Living things and their habitats (Y2) - 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 and name a variety of plants and animals in their habitats, including microhabitats - 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
Animals (Y1) - 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	Plants (Y1 & Y2) - 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 - 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
Animals (Y2) - 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	Materials (Y1 & Y2 Curriculum) - 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 - 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
SWAP FOR 27/28 <i>explore and compare the differences between things that are living, dead, and things that have never been alive</i> <i>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</i> <i>identify and name a variety of plants and animals in their habitats, including microhabitats</i>	TEACH 26/27 Animals (Y2) <i>notice that animals, including humans, have offspring which grow into adults</i> <i>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</i> <i>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</i>

National Curriculum in England: Science

Purpose of Study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop 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
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Scientific knowledge and conceptual understanding (summarised)

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

The nature, processes and methods of science, spoken language & curriculum (summarised)

Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions. **The programmes of study for science are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage.** Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study.

Attainment Targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Key Stage 1 Subject Content

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. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. 'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study.

Working Scientifically - NC statutory requirements

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • Asking simple questions and recognising that they can be answered in different ways • Observing closely, using simple equipment • 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.

Working Scientifically - NC notes & guidance (non-statutory)

Pupils in years 1 & 2 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships. They should ask people questions and use simple secondary sources to find answers. They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language. These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the programme of study can be met by the end of year 2. Pupils are not expected to cover each aspect for every area of study.