

Knowledge and Skills Sequencing Document

Science National Curriculum 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

Science

To enhance children's inquisitive nature and understand how science impacts our world and the future.

Intent

Biology, Chemistry and Physics are sequenced and linked across the school with a focus on scientific enquiry. Children will develop a love of science and an ability to plan, observe, record, conclude and evaluate. From nursery to year six children will discover the wonders of science, develop scientific knowledge and conceptual understanding, be able to question, reason and make links to the world around them.

	Science Knowledge and Skills Progression					
Curriculum Driver	Reading and Force for Positive Change					
Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery		In the Woods		At the Farm	In the Garden	
		The Natural World		The Natural World	The Natural World	
Reception		Winter		Growing		Under the Sea and at the Seaside
		The Natural World		The Natural World		The Natural World
Y1	What's that weather?			Animal Kingdom	Secret Garden	
	Seasonal Changes	Explore materials Y1	Seasonal change, plants, growth	Animals, including Humans	Year 1 and 2 Plants	Materials Y1
Y2	Who are we?			Spring has Sprung	Reduce, Reuse, Recycle	
	Living things and their habitats	Plants Y2	Habitats	Animals including humans	Year 1 and 2 Materials	Humans
Y3	Let There Be Light		May The Force Be With You	Extreme Earth	Let It Grow	
	Light	Plants	Forces and Magnets	Rocks and Soils	Plants	Animals including humans
Y4		Our Changing world(x2)		Buzzers, Bulbs and Batteries	Dem Bones Dem Bones	Viva Espana
	Living things and habitats	States of Matter Living things and their habitats	States of matter/ materials revise	Light and Electricity	Animals, including humans	Sound
Y5	Food Glorious Food		The Rainforest	Earth and Space		Ancient Egypt
	Properties of materials	Revision properties of materials and changes	Living things and their habitats	Earth and Space	Animals including humans	Forces
Y6	Evolution and Inheritance	CSEye Investigates (x2)				Fit and Fabulous
	Evolution and Inheritance	Light and Electricity	Living things and habitats	Working scientifically	Working scientifically	Animals Including Humans

Reception			
		Key Knowledge	Key Vocabulary
Scientific Area: The Natural World (ELG) Link: YN: Plants and animals, naming common plants, animals and their environments, materials	Winter Growing Under the sea	Know how to care for the natural world around us using their senses Know there are 5 senses and be able to talk about what they see, hear, feel, touch, smell Know the differences between materials and notice the changes-e.g. melting/freezing Know some environments are different from the one in which they live Know and describe animals that live in different habitats. Know the names of different types of weather and seasons Know the effects of the seasons on the natural world to know how things grow Know that animals behave differently as the seasons change Know how to plant a seed and care for a growing plant.	Seasons, Autumn, Winter, Spring, Summer, growing, growth, habitat, sea, Antarctica, penguin, snow, ice, cold, melting, bean, root, seeding, stem, egg, hatching, chick, turtle, shark, whale, dolphin, water, plastic, ocean, seaweed,
EYFS Framework Content	Statutory Educational Programme <i>Understanding of the world</i> Understanding the world involves guiding children to make sense of their physical world and their community.		
Continuous provision Personal Experiences Diverse World Widening Vocabulary	Science Skills While children are playing and exploring, teachers should be modelling, encouraging and supporting them to do the following: • show curiosity and ask questions • make observations using their senses and simple equipment • make direct comparisons • use equipment to measure • record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets • use their observations to help them to answer their questions • talk about what they are doing and have found out • identify, sort and group.	Key Knowledge Know why we need to respect the natural environment, and all living things. Know that the Forest Garden is a habitat. Know how to spot a shadow Know that there are sounds that come from different sources Know how to change how things work, know that the wind can move objects, know that objects can be moved in water Explore and make decisions themselves, thereby developing their own scientists’ mind. Know people who are familiar to them and describe them Know how to take care of themselves Know how the Forest Garden supports our environment. Question the natural world and investigating; e.g. find out and identify features of living things; drawing pictures of animals and plants. Observe similarities, differences, patterns, change in nature; e.g. seasons and changing states of matter, weather and life cycles of a plant or an animal, drawing on their experiences and what has been read in class.	

Force for Positive Change	➤ Use of plastic and plastics in the ocean
Skills: Explore, Observe, communicate, (identify similarities and differences, predict) investigate and manipulate,	
Winter Growing Under the sea	• Observe and draw pictures of the natural world including animals and plants. • Observe and interact with natural processes, e.g. ice melting, magnets, a seed growing • Experience the world through the 5 senses E.g. touching and describing an iceberg in a penguins tray • Comment on the plants and animals they have seen or learnt about: • Identify similarities and differences between their own environments and contrasting environments, e.g. Antarctica • Observe the life cycle of a chick and a bean and use vocabulary to communicate changes observed • Communicate about the weather: note and record the weather E.g. through pictures and simple phrases and sentences • Ask questions based on what they are experiencing and seeing
Early Learning Goal: The Natural World Expected Level of Development at the end of Reception	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.

Year 2			
Learning Journey		Key Knowledge	Key Vocabulary
Who we are			
Science Domain	Biology		
National Curriculum Content	- 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 the 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. Links: YN/R: Variety of habitats and change in seasons	- Know that objects are either living dead or have never been alive. Living things are plants (including seeds) and animals. - Know that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. - Know that habitats provide the basic needs of animals and plants – shelter, food and water. - Know the names of plants and animals in habitats and micro – habitats e.g in a woodland –in a leaf litter, on the bark of a tree. - Know that plants and animals depend on each other for food and shelter through a simple food chain. - Know how conditions affect the number and types of animals and plants living there.	living, dead, alive, never been alive, suited, suitable, basic needs, food chain, shelter, move, feed, habitats, micro-habitats, animals, plants, food chain, source of food, environment
Force for Positive Change			
Science Skills	Skill Assessment		
Planning	- Children continue to develop their ability to ask simple questions, such as what something is, how things are similar and different, how things change and how they happen. - The children are involved in planning how to use resources provided, E.g. decide which non-standard units to use to measure - They use different types of enquiry to help them answer the questions.		
Observing	- Children make careful observations to support identification, comparison and noticing change. E.g. How are animals suited to their habitat in the ocean, in the rainforest? - They use appropriate senses to make their observations. E.g. sight to observe (using magnifying glasses) different animals in different habitats and how living things depend on each other. - They begin to take measurements, initially by comparisons, then using non-standard units, e.g. cubes, teddy bears, straws...		
Recording	- The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing, E.g. What animals live in a woodland? Under a pond? - They record their measurements e.g. a tally graph to show which animals live in which environments		
Concluding	Children say what they have found out in order to answer a question.		

	- With support, they are encouraged to use their observations, measurements they have taken, data they have collected to draw a conclusion to a question. - The children recognise 'biggest and smallest', 'most and least' 'best and worst' from their data. E.g. The place for snails to live is...
Evaluating	•
Possible enquires:	
Identifying, classifying and grouping	How would you classify things from our environment (choosing your own criteria) to show which are living, dead or have never been alive? How would we classify a flame? Is a deciduous tree dead in winter?
Observing Over Time	What animals live in micro-habitats throughout the year? (under a rock, log, in a pond, bush, long grass)
Pattern Seeking	Where do snails live?
Comparative and Fair Testing	
Researching	Use secondary resources to name plants and animals seen in the local environment that they may not currently be able to name (Woodland trust resources)

Year 4			
Learning Journey		Key Knowledge	Key Vocabulary
Dem bones, Dem bones			
Science Domain	Biology		
National Curriculum Content	- 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 animals have skeletons and muscles for support, protection and movement - describe the simple functions of the basic parts of the digestive system in humans - identify the different types of teeth in humans and their simple functions - construct and interpret a variety of food chains, identifying producers, predators and prey Year Group Links: Y1: Labelling basic human body parts Y2: Food groups and exercise	- Know that animals, need to eat (from the different food groups) in order to get the nutrients they need for the body to stay healthy - Know that humans, and some other animals, have skeletons and muscles which help them move and provide protection and support. - Know that food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. - Know the main body parts associated with the digestive system and the special functions they have. - Know that humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing). - Know the producers, predators and prey within a food chain.	Nutrition, carbohydrates, sugars, protein, vitamins, minerals, fibre, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints Human digestive system, digestive mouth tongue; mixes, tastes moistens, saliva, oesophagus, mastication, bolus, transports stomach acid, enzymes, small intestine; absorbs water large intestine: compacts colon, teeth incisors; cutting canines; ripping molars; chewing grinding, brush, floss, plaque Vertebrates: fish, amphibians, reptiles, birds, mammals Invertebrates: snails, slugs, worms, spiders, insects Skelton, bones, muscles, joints, support, protection, movement, food chain sun, producers, prey, predators, carnivore, herbivore, omnivore
Force for Positive Change			
Science Skills	Skill Assessment		
Planning	- Children ask relevant questions and independently use a range of question stems and answer these questions. What happens when...How do/does...If we... - The children answer questions posed by the teacher. E.g. What is the difference between producers, predators and prey?		

	- Given a range of resources the children decide for themselves how to gather evidence to answer questions. E.g a variety of jaw bones/teeth pictures, artefacts - With support, they recognise when secondary sources can be used to answer questions that cannot be answered through practical work. - They can explain what type of enquiry they have used.
Observing	They make systematic and careful observations. E.g. give examples of bones related to different parts of the body. Examine their features closely and identify evidence of how they might fit together..
Recording	- Where appropriate, the children can decide how to record and present evidence. - Record findings using simple scientific language, photographs, drawings, labelled diagrams, bar charts and tables. E.g Construct a 2D model of the skeleton with their partner's bodies to position parts correctly and labelling as many bones as possible with post it notes
Concluding	- With increasing independence children draw conclusions based on their evidence reporting their findings through oral and written accounts. E.g. If we didn't have a skeleton... - They use straightforward scientific evidence to answer questions or to support findings. E.g this is a a producer because its teeth show... - Children ask further questions which can be answered by extending the same enquiry. Eg. Do all animals have skeletons?
Evaluating	
Possible enquires:	
Identifying, classifying and grouping	Compare and contrast different types of teeth/jaw bones- How can we organise teeth/jaw bones into groups? (linking to their function in aid of making a food chain
Observing Over Time	
Pattern Seeking	
Comparative and Fair Testing	
Researching	- Use secondary sources to identify what different animals in a particular habitat/environment in order to construct a food chain. - Research part of the digestive system (Present in different ways)