

Learning Together, Success Forever

Long Term Planning

Science

Science Long Term Plans

Topic Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	EYFS People who help us Nursery rhymes			nal tales our bodies	Explorers	l /map skills
	The changing seasons					
Year 1	Everyday Materials We are material scientists		Animals including humans We are anatomists	Animals including humans We are zoologists		ants <i>botanists</i>
		Seasonal change We are phenologists and meteorologists				
		yday materials erial scientists		iding humans nysiologists	We are Pla	nd their habitats biologists ants rrists and botanists

EYFS	Autumn	Spring	Summer
Development Matters	People Who Help Us	Traditional Tales	Explorers

Characteristics of Effective	Playing and exploring – children investigate and experience things, and 'have a go.' Active learning – children concentrate and keep on trying if they encounter difficulties, and enjoy achievements.
Teaching and Learning	Creating and thinking critically – children have and develop their own ideas, make links between ideas, and develop strategies for doing things.
	3 and 4 year olds will be learning to:
Understanding the world	Use all their senses in hands-on exploration of natural materials.
Understanding the world	Explore collections of materials with similar and/or different properties.
	Talk about what they see, using a wide vocabulary.
	Explore how things work.
	Plant seeds and care for growing plants.
	Understand the key features of the life cycle of a plant and an animal.
	Begin to understand the need to respect and care for the natural environment and all living things.
	Explore and talk about different forces they can feel.
	Talk about the differences between materials and changes they notice.
	Children in reception will be learning to:
	Explore the natural world around them.
	Describe what they see, hear and feel outside.
	Recognise some environments that are different from the one in which they live.
	Understand the effect of changing seasons on the natural world around them.
	The Natural World ELG Children at the expected level of development will:
	Explore the natural world around them, making observations and drawing pictures of animals and plants
	Know some similarities and differences between the natural world around them and contrasting environments, drawing on
	their experiences and what has been read in class
	Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter
	3 and 4 year olds will be learning to:
Davis and Casial and Emotional	Be increasingly independent in meeting their own care needs, eg., brushing teeth, using the toilet, washing and drying their hands
Personal, Social and Emotional	thoroughly.
Development	Make healthy choices about food, drink, activity and toothbrushing.
	Children in reception will be learning to:
	Manage their own needs.
	- Personal hygiene
	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 Menoring Self ELC Children at the expected level of development will:
	Managing Self ELG Children at the expected level of development will:
	Be confident to try new activities and show independence, resilience and perseverance in the face of challenge Final in the receipt for makes the property and the stable perseverance in the face of challenge.
	Explain the reasons for rules, know right from wrong and try to behave accordingly Manage their and try to be a significant and try to behave accordingly. Manage their and try to be a significant and try to behave accordingly. Manage their and try to behave a significant and try to behave accordingly.
	 Manage their own basic hygiene and personal needs, including dressing, going to the toilet, and understanding the importance of healthy food choices

Key Stage 1

Year 1 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 Working gathering and recording data to help in answering questions scientifically Pupils in years 1 and 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 Autumn/Spring/Summer 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. Pupils should be taught to: All children will be able to: name the four seasons Observe changes across the four seasons. talk about different types of weather. talk about some changes which happen over the year Observe and describe weather associated with the seasons and how day length varies. Most children will be able to: name the four seasons and identify when in the year they occur Show understanding of concepts using scientific vocabulary correctly: Seasonal describe weather in different seasons over a year In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each describe days as being longer (in time) in the summer and shorter in change day until mid-winter (about 8 hours) before getting longer again. The weather also changes describe other features that change through the year with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in Use the evidence gathered to describe the general types of weather We are the summer. The change in weather causes many other changes. Some examples are: and changes in day length over the seasons. Use their evidence to describe some other features of their phenologists numbers of minibeasts found outside: seed and plant growth; leaves on trees; and type of surroundings, e.g. themselves, animals, plants that change over the clothes worn by people. and Demonstrate their knowledge in different ways e.g. making a meteorologists Working scientifically to apply knowledge in familiar related contexts, including a weather forecast video, writing seasonal poetry, creating seasonal artwork range of enquiries: • Collect information about the weather regularly throughout the year. Some children will be able to: follow their own lines of enquiry and interests independently, using • Present this information in tables and charts to compare the weather across the seasons. the skills of working scientifically and scientific knowledge. Collect information, regularly throughout the year, of features that change with the seasons e.g. plants, animals, humans.

Present this information in different ways to compare the seasons.

seasons.

· Gather data about day length regularly throughout the year and present this to compare the

Yea	ar 1		
		Pupils should be taught to: 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.	All children will be able to: • label a picture or diagram of an object made from different materials • describe the properties of different materials
Autumn	Everyday Materials We are material scientists	Show understanding of concepts by using scientific vocabulary correctly: All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties. Working scientifically to apply knowledge in familiar related contexts, including a range of enquiries: • Classify objects made of one material in different ways e.g. a group of objects made of metal. • Classify in different ways one type of object made from a range of materials e.g. a	Most children will be able to:
		collection of spoons made of different materials. • Classify materials based on their properties. • Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters. Pupils should be taught to:	scientifically and scientific knowledge. All children will be able to:
		 Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Recognise that humans are animals. Compare and describe differences in their own features (eye, hair, skin colour, etc.). Recognise that humans have many similarities. 	 play and lead 'Simon says' follow instructions involving parts of the body during PE label parts of the body on pictures and diagrams explore objects using different senses Most children will be able to: use first-hand close observations to make detailed
Spring A	Animals including humans We are anatomists	Show understanding of concepts by using scientific vocabulary correctly: Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. Working scientifically to apply knowledge in familiar related contexts, including a range of enquiries: • Make first-hand close observations of parts of the body e.g. hands, eyes. • Compare two people. • Take measurements of parts of their body.	 drawings name body parts correctly when talking about measurements and comparisons e.g. "My arm is x straws long." "My arm is x straws long and my leg is y straws long. My leg is longer than my arm." "We both have hands, but his are bigger than mine." "These people have brown eyes and these have blue." talk about their findings from investigations using appropriate vocabulary e.g. "My fingers are much better at feeling than my toes" "We found that the crisps all taste the same."
		 Compare parts of their own body. Look for patterns between people e.g. Do people with big hands have big feet? Classify people according to their features. Investigate human senses e.g. Which part of my body is good for feeling, which is not? Which food/flavours can I identify by taste? Which smells can I match? 	Some children will be able to: follow their own lines of enquiry and interests independently, using the skills of working scientifically and scientific knowledge.
Sp	Animals including humans	Pupils should be taught to: • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.	All children will be able to: • name a range of animals which includes animals from each of the vertebrate groups. • label key features on a picture/diagram.

We are zoologists	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, and including pets). Find out and describe how animals look different to one another. Group together animals according to their different features. Recognise similarities between animals: Structure: head, body, way of moving, senses, body covering, tail. Animals have senses to explore the world around them and to help them to survive. Recognise that animals need to be treated with care and sensitivity to keep them alive and healthy. Animals are alive; they move, feed, grow, use their senses and reproduce. Show understanding of concepts by using scientific vocabulary correctly: Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. Working scientifically to apply knowledge in familiar related contexts, including a range of enquiries: Alake first-hand, close observations of animals from each of the groups Compare two animals from the same or different groups. Classify animals using a range of features. Identify animals according to what they eat.	• compare two animals from the same or different groups. Most children will be able to: • describe the key features of these named animals • write descriptively about an animal • describe what a range of animals eat • compare two animals from the same or different groups. • sort and group animals using similarities and differences • use simple charts etc. to identify unknown animals • create a drawing of an imaginary animal labelling its key features • use secondary resources to find out what animals eat, including talking to experts e.g. pet owners, zookeepers etc. Some children will be able to: • follow their own lines of enquiry and interests independently, using the skills of working scientifically and scientific knowledge. Most children will be able to: • sort objects and materials using a range of properties • choose an appropriate method for testing an object for a particular property • use their test evidence to answer the questions about properties e.g. "Which cloth is the most absorbent?" Some children will be able to: • follow their own lines of enquiry and interests independently, using the skills of working scientifically and scientific knowledge.
Plants We are botanists	Pupils should be taught to: • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	All children will be able to: • name trees and other plants that they see regularly • name some of the key features of these trees and plants.

 Identify and describe the basic structure of a variety of common flowering plants, including trees.

Show understanding of concepts by using scientific vocabulary correctly:

Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring.

Working scientifically to apply knowledge in familiar related contexts, including a range of enquiries:

- Make close observations of leaves, seeds, flowers etc.
- Compare two leaves, seeds, flowers etc.
- Classify leaves, seeds, flowers etc. using a range of characteristics.
- · Identify plants by matching them to named images.
- Make observations of how plants change over a period of time.
- When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them.

- know that some trees lose their leaves and some don't.
- point to and name the parts of a plant.
- Can use simple charts etc. to identify plants

Most children will be able to:

- name trees and other plants that they see regularly
- describe some of the key features of these trees and plants e.g. the shape of the leaves, the colour of the flower/blossom
- point out trees which lost their leaves and those that kept them the whole year
- point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green
- sort and group parts of plants using similarities and differences
- use simple charts etc. to identify plants
- collect information on features that change during the year
- use photographs to talk about how plants change over time

Some children will be able to:

 follow their own lines of enquiry and interests independently, using the skills of working scientifically and scientific knowledge.

Working scientifically

- 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

Pupils in years 1 and 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.

Plants

We are horticulturists and botanists

Pupils should be taught to:

- 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.
- Plants are living and eventually die.

Show understanding of concepts by using scientific vocabulary correctly: Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.

Working scientifically to apply knowledge in familiar related contexts, including a range of enquiries:

- Make close observations of seeds and bulbs.
- · Classify seeds and bulbs.
- Research and plan when and how to plant a range of seeds and bulbs.
- Look after the plants as they grow weeding, thinning, watering etc.
- Make close observations and measurements of their plants growing from seeds and bulbs.
- · Make comparisons between plants as they grow.

All children will be able to:

 talk about how plants that they have grown from seeds and bulbs have changed over time

Most children will be able to:

- describe how plants that they have grown from seeds and bulbs have developed over time
- · identify plants that grew well in different conditions
- spot similarities and difference between bulbs and seeds
- nurture seeds and bulbs into mature plants identifying the different requirements of different plants

Some children will be able to:

 follow their own lines of enquiry and interests independently, using the skills of working scientifically and scientific knowledge.

Autumn	Uses of everyday materials We are material scientists	Pupils should be taught to: 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 Some materials can be found naturally; others have to be made Show understanding of concepts by using scientific vocabulary correctly: All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness Working scientifically to apply knowledge in familiar related contexts, including a range of enquiries: Classify materials. Make suggestions about alternative materials for a purpose that are both suitable and unsuitable. Test the properties of materials for particular uses e.g. compare the stretchiness of fabrics to select the most appropriate for Elastigirl's costume, test materials for waterproofness to select the most appropriate for a rain hat	All children will be able to: name an object, say what material it is made from and identify its properties label a picture or diagram of an object made from different materials Most children will be able to: name an object, say what material it is made from, identify its properties and make a link between the properties and a particular use for a given object can identify what properties a suitable material needs to have whilst changing the shape of an object can describe the action used use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those that cannot recognise that a material may come in different forms which have different properties sort materials using a range of properties explain using the key properties why a material is suitable or not suitable for a purpose begin to choose an appropriate method for testing a material for a particular property use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat? Some children will be able to: follow their own lines of enquiry and interests independently, using the skills of working scientifically and scientific knowledge.
Spring	Animals including humans We are physiologists	Pupils should be taught to: Notice that humans, have offspring which grow into adults. Find out about and describe the basic needs of 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. Medicines can be useful when we are ill. Medicines can be harmful if not used properly. Notice that animals, have offspring which grow into adults. Find out about and describe the basic needs of animals, for survival (water, food and air). Show understanding of concepts by using scientific vocabulary correctly: Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses. Working scientifically to apply knowledge in familiar related contexts, including a range of enquiries: Ask people questions and use secondary sources to find out about the life cycles of some animals. Observe animals growing over a period of time e.g. chicks, caterpillars, a baby. Ask questions of a parent about how they look after their baby.	All children will be able to: talk about how animals, including humans, have offspring which grow into adults state the basic needs of animals, including humans, for survival observe how animals, including humans, grow. Most children will be able to: describe how animals, including humans, have offspring which grow into adults, using the appropriate names for the stages state the importance for humans of exercise, eating the right amounts of different types of food, and hygiene name foods in each section of the Eatwell Guide animals, including using diagrams, the life cycle of some animals, including humans, and their growth to adults e.g. by creating a life cycle book for a younger child measure/observe how animals, including humans, grow. show what they know about looking after a baby/animal by creating a parenting/pet owners' guide explain how development and health might be affected by differing conditions and needs being met/not met

		 Explore the effect of exercise on their bodies. Classify food in a range of ways, including using the Eatwell Guide. Investigate washing hands, using glitter gel. 	 follow their own lines of enquiry and interests independently, using the skills of working scientifically and scientific knowledge.
			Most children will be able to: name an object, say what material it is made from, identify its properties and make a link between the properties and a particular use for a given object can identify what properties a suitable material needs to have whilst changing the shape of an object can describe the action used use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those that cannot recognise that a material may come in different forms which have different properties sort materials using a range of properties sort materials using a range of properties explain using the key properties why a material is suitable or not suitable for a purpose begin to choose an appropriate method for testing a material for a particular property use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat? Some children will be able to: follow their own lines of enquiry and interests independently, using the skills of working scientifically and scientific knowledge.
Summer	Living things and their habitats We are biologists	Pupils should be taught to: 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 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. Different kinds of plants and animals live in different kinds of places. There are different kinds of habitat near school which need to be cared for Habitats provide the preferred conditions for the animals/plants that live there (compare local habitats and less familiar examples). Show understanding of concepts by using scientific vocabulary correctly: All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.) An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels). Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them move and find food and plants have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants — shelter, food and water. Within a habitat there are different micro-habitats e.g. in a woodland — in the leaf litter, on the bark of trees, on the leaves. These	All children will be able to:

Working scientifically to apply knowledge in familiar related contexts, including a	
range of enquiries:	
Explore the outside environment regularly to find objects that are living, dead and have	
never lived.	
Classify objects found in the local environment.	
Observe animals and plants carefully, drawing and labelling diagrams.	
Create simple food chains for a familiar local habitat from first-hand observation and	
research.	
Create simple food chains from information given e.g. in picture books (Gruffalo etc.).	