Science
Scheme of Work

The Orchard Curriculum

Intent

At The Orchard we want all children to master skills and gain a deep, secure understanding of their knowledge across the curriculum. We want the children to be motivated to learn, to be able to reason and use and apply their learning. We will provide a language rich curriculum and high-quality teaching for mastery supported by thorough planning and assessment to build on prior learning.

Aims for Early Years

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.

Aims for the end of Key Stage One

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.

Books and stories greatly enhance the children's learning environment and support their development in both science and in language development. Greater use of books within science lessons can address issues regarding the relevance and accessibility of science as well as provide stimulating opportunities for developing children's thinking and communication skills. Using stories as an introduction improves motivation and concentration and allows children to see a reason for carrying out a scientific investigation.

	EYFS	Year 1	Year 2
Seasonal Changes 	Early learning goal – the natural world Explore the natural world around them, making observations and drawing pictures of animals and plants **Knowledge** 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	Pupils should be taught to: ♣ observe changes across the four seasons ♣ observe and describe weather associated with the seasons and how day length varies. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. **See National Curriculum Key Stage 1 Programme of study (Science) Notes and guidance (non-statutory) for further details** **Knowledge** To know what the four seasons are and know the weather associated with each season. To know that day lengths vary because of this.	Although it is not a requirement for Year 2 children to cover Seasons as part of the curriculum, we believe that conversations about the seasons should be threaded through other areas of our science. For example: winter discussions could be based on migration and hibernation in *Living Things and their Habitats.*

	world around them, including the seasons and changing states of matter. They will know the features of their own immediate environment and how environments might vary from one another. They will know the names of animals and plants and know how changes occur. Look closely at similarities, differences, patterns and change.		
Resources/visitors/trips	Gardening week with parents. Sensory gardens	https://www.bbc.co.uk/teach/class-clips-video/pshe-eyfs-ks1-go-jetters-environment-weather-and-climate/zfb3scw https://explorify.wellcome.ac.uk/en/activities	
Skills	• Talking • Observing • Recording • Measuring	• Observing using simple equipment (measuring rainfall) • Performing simple tests • Record: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change. • Identifying and classifying	

Key vocabulary	• Weather • Rain • Wind • Snow • Sun/sunny • Clouds/cloudy • Wet • Hot • cold	• Spring • Summer • Autumn • Winter • Seasons • Temperature • Rain fall	
Recording	Hunting in the environment for different natural materials (leaves) Adult records the children's quotes. Children record using clipboards.	Weather diaries Photographs Paintings Weather forecasts	
Stories	Trees The Gruffalo – discussions on the environment and links to The Blue Penguin.	One Year with Kipper provides a nice link into work on Seasonal Change as children work to observe changes across the four seasons. Snowflakes Cerrie Burnell & Laura Ellen Anderson https://www.booksfortopics.com/	
Key questions	What is the weather like today?	Why are there so many leaves on the ground? Why don't we need to wear so many clothes in summer?	

	What should we be wearing today? Why are we feeling hot/cold today? How can we stay warm/dry/cool? How can we keep plants alive? Why do leaves fall off trees? How can we take care of plants?	Why are there so many leaves on the ground in autumn?	
	EYFS	**Year 1**	**Year 2**
Animals including humans.	Early learning goal – the natural world Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own	Pupils should be taught to: • Know 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)	Pupils should be taught to: • 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

 Knowledge	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. Look closely at similarities, differences, patterns and change.	• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense **See National Curriculum Key Stage 1 Programme of study (Science) Notes and guidance (non-statutory) for further details**	right amounts of different types of food, and hygiene • know the basic stages in a life cycle for animals, (including humans) • know why exercise and a balanced diet are important for humans • know why having good hygiene are important for humans **See National Curriculum Key Stage 1 Programme of study (Science) Notes and guidance (non-statutory) for further details.**
Resources/visitors/trips	Sensory garden Ducklings Butterflies	https://explorify.wellcome.ac.uk/en/activities	https://explorify.wellcome.ac.uk/en/activities
Skills	• Talking • Observing • Recording • Measuring • Drawing	• Observe • Compare and contrast: animals at first hand or through videos and photographs • Group: animals according to what they eat • Use their senses: to compare different textures, sounds and smells.	• Observations • Recording accurately • Talking about their findings • Explaining with reasons.

Key vocabulary	Life cycles, growing, changing, habitats, features, ducklings, ducks. Key vocab linked to butterflies.	Fish, amphibians, reptiles, birds and mammals, carnivores, herbivores and omnivores. • Head, nose, ears, eyes neck, shoulders, arms, elbows, wrists, hands, fingers, chest, back, tummy, legs, ankles, feet, heels, toes • Senses: smell/sight/touch/hearing/taste	• Healthy, grow, older, younger, elderly, exercise, nutrition, nutritious, offspring, need, luxury, hygiene, offspring, proteins, fats, survival, diet.
Recording	Children will draw pictures of what they can see and write the vocabulary linked to the topic. Adults will record the children's quotes.	Writing questions to investigate. Make a clay model of our own bog baby and discussing its habitat. Drawing and annotating.	Children will learn to take photographs and annotate. They will record a simple human life cycle. They will record a healthy plate using pictures. Children will observe change over time and record changes.
Stories	The Hungry Caterpillar The Blue Penguin Non-fiction animal texts.	Bog Baby by Jeanne Willis Reflection: Can you create your own non-fiction book on a 'Visit to the Zoo'?	Once there were giants. Burger Boy is suggested by The Learning Challenge Curriculum. Handa's Surprise Tadpole's Promise Tad by Benji Davies
Key questions	How do we look after animals? What needs do they have?	Would we call Bog Baby a wild animal? What is a wild animal? Why would it not be sensible for all animals to live in England?	Why is it important for me to keep healthy? Why is it important for me to exercise?

	Why do they live in this habitat? Is this the only habitat for them? What do they eat? Why?	What animal group would Bog Baby belong to? Fish, amphibian, birds or mammals? Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals) How are humans different from most animals? Is Bog Baby a carnivore, herbivore or omnivore? What are carnivores, herbivores and omnivores? What do we need to do to keep our pets happy? Which plants and animals will we find in our parks?	What do people do currently to keep healthy? What should pupils do to look after their body? Why should we eat more fruit? What is meant by personal hygiene? What do we mean by the term 'off-spring' and what do we know about animals' off-spring? What should we do to keep our pets healthy?
	EYFS	**Year 1**	**Year 2**
Materials	Early learning goal – the natural world Children will understand some important changes and processes in the natural world around them including the seasons and the changing states of matter	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	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

<table>
<tr>
<td> 

Knowledge</td>
<td>Freezing and melting.
Floating and sinking.
Explore how things work.

Explore and talk about different forces they can feel.

Talk about the differences between materials and changes they notice.</td>
<td colspan="2">See National Curriculum Key Stage 1 Programme of study (Science) Notes and guidance (non-statutory) for further details.</td>
<td>squashing, bending, twisting and stretching

See National Curriculum Key Stage 1 Programme of study (Science) Notes and guidance (non-statutory) for further details.</td>
</tr>
<tr>
<td>Resources/visitors/trips</td>
<td>Space virtual reality visit.

Central area where children have constant access to materials which they can explore the properties of.</td>
<td colspan="3">Materials from our science resources.
- In these boxes we will find a variety of fabrics, metals, glass, plastics etc.
- These can be used for classifying and sorting.
- Please note that the materials from these boxes <u>should be used in different ways using the same language between year groups</u>. For example: the Year one children will compare and group together, whereas, Year two children will identify and compare suitability of the material. This should form the basis of your initial planning for Materials in Key Stage One.</td>
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<td>Skills</td>
<td>• Talking about similarities and differences</td>
<td>• Testing: simple tests to explore questions, for example: 'What is the best material for….?
• Distinguish between an object and the material from which it is made.
• Describe materials using their senses.</td>
<td>• Compare: uses of everyday materials in and around the school with materials found in other places
• Identify: what objects are made from and why</td>
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	• Using appropriate vocabulary • Observing • Recording • Measuring • Using all senses • Exploring collections	• Describe materials using their senses, using specific scientific words. • Explain what material objects are made from? • Explain why a material might be useful for a specific job? • Name some different everyday materials e.g. wood, plastic, metal, water and rock. • Sort materials into groups by a given criteria. • Describe things that are similar and different between materials. • Explain what happens to certain materials when they are heated, e.g. bread, ice, chocolate. • Explain what happens to certain materials when they are cooled, e.g. jelly, heated.	• Classify: different materials and their uses. • Record: different uses for the same materials I.e., metal can be used in many different ways. • Record: why materials are **not** used for certain objects. Understand that glass, for example, is unsuitable for making cutlery. • Explain how solid shapes can be changed by squashing, bending, twisting and stretching.
Recording	As the children make their observations, adults should record using quotes. Children should be able to write some of the vocabulary associated with the topic, draw pictures and take photographs of their collections.	Children to record their observations by drawing and annotating. Adults should record quotes of interesting comments children have made which are pertinent to the topic. Children should be able to speak in full sentences using the topic specific vocabulary.	Children will start with key vocabulary. What do they think it means? They will sort objects into lists according to their properties and materials. They will decide how the purpose of the material dictates its property. Children will link their ideas in science to writing creatively in English.

Stories	Begin to make sense of their own life-story and family's history. Astro Girl – materials of the space suit as an emphasis.	'Kipper's Rainy Day' Mick Inkpen 'Traction Man is Here!' Grey & Cape 'The Slimy Book' Babette Cole 'Biscuit Bear' Grey & Cape 'The Queen's Knickers' Nicholas Allan https://www.booksfortopics.com/	Traction Man and Turbo Dog https://www.booksfortopics.com/
Key Vocabulary	Natural, living, alive, plants, animals, specific vocabulary associated with the particular animals/ plants they are exploring or planting.	Similar, different, cooled, heated, material, property, item, object, metal, plastic, wood.	Children will explore all vocabulary associated with properties (hard, soft, smooth etc), they will revisit prior learning from Year One about changes you can make (cool, heat, bend), all material names (wood, plastic, metal) but in the context of the year two curriculum.
Key questions	Is this natural? Is this alive? How does it grow? What does this remind us of? What is similar to it? Does it float? Does it sink?	What is it made from? Is it an item or a material? What happens when we…? How does it change when…? Why is this material useful? How can it be changed?	How can you classify your toys taking account of the materials they are made of? What are the main reasons for choosing materials for different parts of the school buildings? What are the advantages and disadvantages of some common materials? How can you design and make your own Traction Man using a variety of different materials? How can you design a perfect playground using a range of materials and explain why you have chosen the materials?

	EYFS	Year 1	Year 2
Plants	Early learning goal – natural the world Children will know the difference about contrasting environments. Look closely at similarities, differences, patterns and change.	**Please note: Most of this unit will be covered in Year 2. The children are going to study all aspects of plants including the Year 1 content. Year 1 children will, however, spend their gardening weeks looking at plants first-hand and will identify, name and describe the common names of flowers and plants.**	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

 Knowledge	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.	Pupils should be taught to: • 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.	**See National Curriculum Key Stage 1 Programme of study (Science) Notes and guidance (non-statutory) for further details.**
Resources/visitors/trips	Sensory gardens. Trips to the local areas. Gardening week. Butterflies (link to animals we should care for)	Gardening week	Gardening week Trips to the local area Planting of their own seeds
Skills	• Talking • Observing • Recording • Measuring	• Observe: perhaps using magnifying glasses • Compare and contrast: familiar plants; describing how they were able to identify and group them • Draw: diagrams showing the parts of different plants including trees. • Record: how plants have changed over time, for example the leaves falling off trees and buds opening	• Observing and recording: the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth • Test: setting up a comparative test to show that plants need light and water to stay healthy. • Describing using subject specific vocabulary.

		• Compare: what they have found out about different plants.	
Recording	Plant seeds and care for growing plants. Drawing plants. Taking photos Teacher recording quotes as children engage with their environment.	Plant seeds and care for growing plants. Recording the children's responses as they're planting and addressing misconceptions.	Children will record the progress of their plant in a diary. They will label the parts of the plant and discuss their purpose. They will plant a seed, take photos of the progress and record. We will also compare the growth of seeds in different environment.
Stories	The story of Jack and the Beanstalk makes a great starting point for teaching the topic of plants to younger primary aged children. The Hungry Caterpillar Non-fiction texts. Tree Seasons book.	Eddie's Garden: and How to Make Things Grow, Sarah Garland I Really Wonder What Plant I'm Growing (Charlie and Lola), Lauren Child The Little Gardener,Emily Hughes Titch, Pat Hutchins https://www.booksfortopics.com/	'Ben Plants a Butterfly Garden' Kate Petty & Alex Scheffler 'Oliver's Vegetables' Vivian French 'Fran's Flower' Lisa Bruce https://www.booksfortopics.com/
Key Vocabulary	Plant, seed, soil, water.	Plant, seed, soil, water.	There should be a thread through their learning in Reception here. Revisit key vocabulary: plant, seed, soil, water. Introduce new vocabulary, displaying clearly in the classroom and use in full sentences: growing, light, roots, stem, leaves.

Key questions	What does a seed become? How can we look after plants? How does it grow?	What does a seed become? How can we look after plants? How does it grow? Why did this one grow better than this one?	What does a seed become? How can we look after plants? How does it grow? Why did this one grow better than this one? *This one will form the basis of our comparative test.* Why are trees so important to our environment? How long do trees live and how can we tell how old they are? What are the seeds of trees like? Which animals would we find living in or around the trees in the woodland? Which flowering plants would we most likely find in the woodlands?
	EYFS	**Year 1**	**Year 2**
Living things and their habitats	Early learning goal – the natural world Children will manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. Children will know the difference about contrasting environments.	Living Things and their Habitats – there is not a National Curriculum requirement for Year 1 children to look at Living Things and their Habitats. However, much of the vocabulary we use in our 'Animals Including Humans' topic will cover key aspects of this. For example: where would we find amphibians? Why is a Bog Baby similar to an amphibian?	Pupils should be taught to: • know the differences between things that are living, dead, and things that have never been alive • Know the 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

 Knowledge	Look closely at similarities, differences, patterns and change. Understand the key features of the life cycle of a plant and an animal. 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. Begin to understand the need to respect and care for the natural environment and all living things.		• 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 **See National Curriculum Key Stage 1 Programme of study (Science) Notes and guidance (non-statutory) for further details.**
Resources/visitors/trips	Butterflies and ducklings.		
Skills	• Talking • Observing • Recording • Measuring		Asking simple questions and recognising that they can be answered in different ways.

	• Drawing • Photography		Observing closely, using simple equipment. Identifying and classifying. Using their observations and ideas to suggest answers to questions. Gathering and recording data to help in answering questions.
Recording	Children will take photographs, make observations (which adults will record), write vocabulary associated with this topic and draw.		Construct a simple food chain that includes humans (e.g. grass, cow, human). Describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes). Find out how the conditions affect the number and type(s) of plants and animals that live there.
Stories	Secrets of the Vegetable Garden: A Shine-a-Light Book, Carron Brown https://www.booksfortopics.com/ The Ugly Duckling.		The Tin Forest The Last Wolf, Mini Grey (This is a twist on the traditional Little Red Riding Hood story with a clear message about environmental sustainability). Lost and Found by Oliver Jeffers The Bog Baby (used in Year one in a different way) The Wild https://www.booksfortopics.com/
Key Vocabulary	Natural, living, alive, plants, animals, specific vocabulary associated with the particular		Habitat, food chain, carnivore, producer, herbivore, apex, predator, source, different habitats (woodlands, ponds).

	animals/ plants they are exploring or planting.		Dead, alive, living, never alive.
Key questions	How do we know it's alive? What does a seed become? How can we look after plants? How does it grow?		How do we know a living thing is alive? (The National Curriculum uses 'flame' as an example) Is a deciduous tree dead in winter? Why is this animal suited to this environment? This will form the basis of the topic but the children will have their own questions at the beginning which we will explore throughout.