

2022/2023

Science in the EYFS at St. Bernadette's





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The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas. This document will help staff understand how the skills taught across EYFS feed into national curriculum subjects. This document demonstrates which statements from Development Matters are prerequisite skills for science within the national curriculum. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for science.

The most relevant statements for science are taken from the following areas of learning:

- Communication and Language
- Personal, Social and Emotional Development
- Understanding the World

In planning and guiding what children learn, practitioners must reflect on the different rates at which children are developing and adjust their practice appropriately, referring to the Characteristics of Effective Teaching and Learning

These are: **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 their achievements for their own sake; **creating and thinking critically** – children have and develop their own ideas, make links between ideas, and develop strategies for doing things.

In addition, the Prime Areas of Learning (Personal, Social and Emotional Development, Communication and Language and Physical Development) underpin and are an integral part of children's learning in all areas.

Science in the EYFS (Development Matters and ELG)		
Three and Four-Year-Olds	Communication and Language	<ul style="list-style-type: none"> • Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development	<ul style="list-style-type: none"> • Make healthy choices about food, drink, activity and tooth brushing.
	Understanding the World	<ul style="list-style-type: none"> • Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • 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.
Reception	Communication and Language	Learn new vocabulary.

			<p>Ask questions to find out more and to check what has been said to them.</p> <p>Articulate their ideas and thoughts in well-formed sentences.</p> <p>Describe events in some detail.</p> <p>Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.</p> <p>Use new vocabulary in different contexts.</p>
	Personal, Social and Emotional Development		<ul style="list-style-type: none"> • Know and talk about the different factors that support their overall health and wellbeing: <ul style="list-style-type: none"> - regular physical activity - healthy eating - tooth brushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian
	Understanding the World		<ul style="list-style-type: none"> • Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.
ELG	Communication and Language	Listening, Attention and Understanding	<ul style="list-style-type: none"> • Make comments about what they have heard and ask questions to clarify their understanding.
	Personal, Social and Emotional Development	Managing Self	<ul style="list-style-type: none"> • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World	The Natural World	<ul style="list-style-type: none"> • 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.



Overview of Science in EYFS

Topics	Prior Learning Check	Nursery	Reception	Learning Leads to...
Animals, excluding humans	<ul style="list-style-type: none"> Explore natural materials, indoors and outside. (Birth to three) 	<ul style="list-style-type: none"> Learn about the life cycle of animals Compare adult animals to their babies Observe how baby animals change over time 	<ul style="list-style-type: none"> Name and describe animals that live in different habitats Describe different habitats 	Year 1 <ul style="list-style-type: none"> 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).
Humans	<ul style="list-style-type: none"> Explore natural materials, indoors and outside. (Birth to three) Make connections between the features of their family and other families. (Birth to three) Notice differences between people. (Birth to three) 	<ul style="list-style-type: none"> Learn about the life cycle of humans Learn about how to take care of themselves Learn about their senses 	<ul style="list-style-type: none"> Describe people who are familiar to them Learn about how to take care of themselves 	Year 1 <ul style="list-style-type: none"> Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
Living things and their habitats	<ul style="list-style-type: none"> Explore natural materials, indoors and outside. (Birth to three) 	<ul style="list-style-type: none"> Explore the surrounding natural environment Explore natural objects from the surrounding environment 	<ul style="list-style-type: none"> Explore the plants in the surrounding natural environment Explore animals in the surrounding natural environment Explore plants and animals in a contrasting natural environment 	Year 1 <ul style="list-style-type: none"> 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. Year 2 <ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify and name a variety of plants and animals in their habitats, including microhabitats.
Plants	<ul style="list-style-type: none"> Explore natural materials, indoors and outside. (Birth to three) 	<ul style="list-style-type: none"> Grow plants and care for them 		Year 1 <ul style="list-style-type: none"> 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. Year 2 <ul style="list-style-type: none"> 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. Year 3 <ul style="list-style-type: none"> Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Seasonal Change	<ul style="list-style-type: none"> Understand the key features of the life cycle of a plant and an animal. (Nursery) 		<ul style="list-style-type: none"> Play and explore outside in all seasons and in different weather Observe living things throughout the year 	Year 1 <ul style="list-style-type: none"> Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.

Topics	Prior Learning Check	Nursery	Reception	Learning Leads to...
Materials, including changing materials	<ul style="list-style-type: none"> Explore materials with different properties. (Birth to three) Explore natural materials, indoors and outside. (Birth to three) 	<ul style="list-style-type: none"> Explore a range of materials Shape and join materials Combine and join materials Combine and mix ingredients Change materials by heating and cooling, including cooking 	<ul style="list-style-type: none"> Explore a range of materials, including natural materials Make objects from different materials, including natural materials Observe, measure and record how materials change when heated and cooled Compare how materials change over time and in different conditions 	<p>Year 1</p> <ul style="list-style-type: none"> 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.
Electricity	<ul style="list-style-type: none"> Repeat actions that have an effect. (Birth to three) 	<ul style="list-style-type: none"> Identify electrical devices Use battery-powered devices 		<p>Year 4</p> <ul style="list-style-type: none"> Identify common appliances that run on electricity.
Light	<ul style="list-style-type: none"> Repeat actions that have an effect. (Birth to three) 	<ul style="list-style-type: none"> Explore light sources Shine light on or through different materials 	<ul style="list-style-type: none"> Explore shadows Explore rainbows 	<p>Year 3</p> <ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change.
Forces	<ul style="list-style-type: none"> Repeat actions that have an effect. (Birth to three) 	<ul style="list-style-type: none"> Feel forces Explore how things work Explore how objects/materials are affected by forces 	<ul style="list-style-type: none"> Explore how to change how things work Explore how the wind can move objects Explore how objects move in water 	<p>Year 2</p> <ul style="list-style-type: none"> Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <p>Year 3</p> <ul style="list-style-type: none"> Compare how things move on different surfaces. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. <p>Year 5</p> <ul style="list-style-type: none"> Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Sound	<ul style="list-style-type: none"> Repeat actions that have an effect. (Birth to three) 	<ul style="list-style-type: none"> Listen to sounds Make sounds 	<ul style="list-style-type: none"> Listen to sounds outside and identify the source Make sounds 	<p>Year 4</p> <ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases.
Earth and Space	<ul style="list-style-type: none"> Explore and respond to different natural phenomena in their setting and on trips. (Birth to three) 		<ul style="list-style-type: none"> Learn about the Earth, Sun, Moon, planets and stars Learn about space travel 	<p>Year 5</p> <ul style="list-style-type: none"> Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Describe the movement of the Moon relative to the Earth. Describe the Sun, Earth and Moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.

Science Topic Overview

	Autumn		Winter			Spring		Summer	Throughout the year
	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Topic 7	Topic 8	Topic 9
Nursery	Humans	Living things and their habitat	Electricity	Light	Materials	Forces	Animal, excluding humans	Plants	Sound
	Autumn								Throughout the year
	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Topic 7	Topic 8	Topic 9
Reception	Humans	Animals excluding Humans	Living things and their habitats	Materials, including changing materials	Light	Forces	Sound	Earth and Space	Seasonal Change



Overview of Sticky Knowledge in EYFS

Topics	Nursery	Reception
Animals, excluding humans	<p>I know the name and can describe animals I have encountered.</p> <p>I know how I cared for the animals we had in nursery.</p> <p>I know how the animals changed over time and can describe this.</p> <p>I know animal names and can match them to their young.</p>	<p>I know that animals live in different habitats and I can name and describe them.</p> <p>I can describe different habitats.</p>
Humans	<p>I know how I have changed since I was a baby</p> <p>I know how to describe humans at different ages/life stages.</p> <p>I know how I look after myself and can compare this to how a baby is looked after.</p> <p>I know how to use my senses to compare smells, sounds, tastes and textures.</p> <p>I know how to use a magnifying glass and can talk about what I can see.</p>	<p>I can describe themselves, family, friends and community.</p> <p>I know my distinguishing features and can draw pictures of myself, family, friends and community.</p> <p>I can talk about what they see when using a mirror.</p> <p>I know how to compare hand, foot and fingerprints and can talk about how they are different.</p> <p>I know how I look after myself and how other people look after me.</p>
Living things and their habitats	<p>I know the name of objects in my collection (shell, feather, stones, acorn, conker, leaf etc.) and I can describe the objects, including patterns I notice on them.</p> <p>I know that natural objects have come from plants and animals.</p> <p>I know I do not damage the living things that encounter in the natural environment. (Care of God's Creation)</p> <p>I know how to show care and I can encourage others to care for things they encounter in the natural environment. (Care of God's Creation)</p>	<p>I know the name of plants and animals in the school grounds and local environment and can describe them.</p> <p>I know how another environment is different to my surrounding natural environment.</p> <p>I know that I do not damage the living things that I encounter in the natural environment.</p>
Plants	<p>I know and can describe some differences between seeds and bulbs.</p> <p>I can identify seeds and bulbs.</p> <p>I know how to plant and care for seeds and bulbs and can talk about this.</p> <p>I can explain that a seed or bulb grew into a plant and then died.</p> <p>I know I do not damage the living things that encounter in the natural environment. (Care of God's Creation)</p> <p>I know how to show care and I can encourage others to care for things they encounter in the natural environment. (Care of God's Creation)</p>	
Seasonal Change		<p>I know that there is different types of weather and can talk about them</p> <p>I know that they are seasons and can talk about the four seasons.</p> <p>I can identify the living things I can see in the playground and on visits during each season.</p>
Materials, including changing	<p>I know the name of the material I am using (cardboard, wood, metal etc.)</p> <p>I know one property of a material and can talk about it (hard, soft etc.)</p> <p>I know that mixtures change when ingredients are added and can talk about this.</p> <p>I know that materials change when cooked and can talk about this.</p> <p>I know that materials change when heated and can talk about this.</p> <p>I know that materials change when frozen and can talk about this.</p>	<p>I know the name of the material I am using and why.</p> <p>I know the multiple properties of the material and why it is suited for its purpose and can talk about this.</p> <p>I can observe changes in their natural world and say why it is different now or will change in the future.</p> <p>I know that some materials change over time and I can compare and describe how they change.</p>

Electricity	<p>I know and can identify devices that use batteries.</p> <p>I know and can identify devices that use mains electricity.</p> <p>I know how to switch battery-powered devices on and off.</p> <p>I know what electrical devices do and can talk about it.</p>	
Light	<p>I know different light sources and can name them.</p> <p>I can describe and compare the brightness of light sources.</p> <p>I know that some materials are reflective and non-reflective.</p> <p>I know that some materials that block light and can identify them.</p> <p>I know that I can see my own reflection in some objects.</p>	<p>I know identify shadows in the playground.</p> <p>I know when shadows can be seen in the playground.</p> <p>I know how shadows changes during the day and can talk about this.</p> <p>I know the light source and the object making a shadow.</p> <p>I can identify shadows that are dark and pale.</p> <p>I can identify and describe a rainbow.</p>
Forces	<p>I know that some objects float and sink and can identify these objects.</p> <p>I know that the shape of some objects can be changed and talk about how I changed their shape.</p> <p>I can describe what they feel when exploring magnets.</p> <p>I can describe what they feel and see when pushing, pulling, bending and twisting objects e.g. springs, elastics, wind-up toys, gears, pulleys etc.</p> <p>I can describe what they feel when riding bikes and scooters on different surfaces and ramps.</p>	<p>I know how I can change objects to make them float or sink (using cubes in a boat)</p> <p>I can talk about how I changed how cars move down ramps or gutters.</p> <p>I can describe how objects fall with and without a parachute.</p> <p>I can describe how a marble moves through different liquids.</p>
Sound	<p>I know that some objects make sounds.</p> <p>I can recognise and describe the sounds made by different objects.</p>	<p>I know that objects make sounds.</p> <p>I can describe sounds they hear.</p> <p>I can an identify the source of sounds.</p> <p>I can describe how they make sounds.</p>
Earth and Space		<p>I can identify the Sun, Moon and stars and talk about how they are different from Earth.</p> <p>I know the differences between day and night.</p> <p>I know some animals are active at night and can talk about them.</p> <p>I can talk about some differences between being on Earth and travelling in space.</p>



Science in Nursery - Animals, excluding humans

Key Learning Learn about the life cycle of animals Compare adult animals to their babies Observe how baby animals change over time	Understanding the World 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	Links with other areas of learning Mathematics Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. Expressive Arts and Design Create closed shapes with continuous lines, and begin to use these shapes to represent objects. Draw with increasing complexity and detail, such as representing a face with a circle and including details.
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Sticky Knowledge: I know the name and can describe animals I have encountered. I know how I cared for the animals we had in nursery. I know how the animals changed over time and can describe this. I know animal names and can match them to their young.	How it is achieved at our school: Caring for eggs and the young animals that emerge, such as chicks, caterpillars, frogs Sharing books with information about animal life cycles (fiction and nonfiction) Looking at and matching pictures of animals and their young Watching videos of animals and their young and how they change over time
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	
	Research Using secondary sources of information to answer scientific questions.	Find out more about the life cycles of the animals observed.
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	How does the ... change over time?
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	Classification - Match animals and their young.

Common Misconceptions Some children may think: <ul style="list-style-type: none"> • all animals lay eggs • the young animal is fully formed inside an egg and just waiting to hatch • the young animal is fully formed inside an egg and just grows until it is big enough to hatch • animals are assembled from body parts within the egg • all animal young are just small versions of the adult and get bigger • animals such as cows and hens "make" milk and lay eggs for us [humans] • humans are not animals. 	Vocabulary: egg, chick, bird, caterpillar, cocoon, chrysalis, butterfly, frog spawn, tadpole, froglet, frog, grow, change, die, names of animals and their young, fur, feathers, scales, tail, wings, beak, claws, paws, hooves, swim, walk, run, jump, jump, fly, patterns, spots, stripes Supplementary vocabulary to be exposed to: life cycle, mane, webbed feet	Books and Rhymes Who is in the egg? by Alexandra Milton Owl Babies by Martin Waddell Brown Bear, Brown Bear, What Do You See? by Bill Martin Jr The Very Hungry Caterpillar
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Science in Nursery - Humans

<p>Key Learning Learn about the life cycle of humans Learn about how to take care of themselves Learn about their senses</p>	<p>Understanding the World Use all their senses in hands-on exploration of natural materials. Begin to make sense of their own life-story and family's history. Understand the key features of the life cycle of a plant and an animal</p>	<p>Links with other areas of learning Personal, Social and Emotional Development Be increasingly independent in meeting their own care needs, e.g. brushing teeth, using the toilet, washing and drying their hands thoroughly. Make healthy choices about food, drink, activity and toothbrushing. Expressive Arts and Design Create closed shapes with continuous lines, and begin to use these shapes to represent objects. Draw with increasing complexity and detail, such as representing a face with a circle and including details.</p>
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<p>Sticky Knowledge: I know how I have changed since I was a baby I know how to describe humans at different ages/life stages. I know how I look after myself and can compare this to how a baby is looked after. I know how to use my senses to compare smells, sounds, tastes and textures. I know how to use a magnifying glass and can talk about what I can see.</p>	<p>How it is achieved at our school: <u>Opportunities to learn about the life cycles of humans</u> • Looking at photographs of the children as babies. • Sharing books about how to look after a baby • Talking to an expectant mother, parent with a baby and elderly person. • Talking to adults about photographs of the adults at different ages • Identifying pictures of babies, toddlers, children, adults and old people in magazines or other media Create self-portraits. • Drawing humans at different ages <u>Opportunities to learn about how to take care of themselves</u> • Talking about how they look after their own health and hygiene, including oral hygiene. • Noticing when they feel hot and cold and how to respond to this Discuss alongside weather change and outdoor wear • Choosing appropriate materials to protect themselves from the Sun</p>	<p><u>Opportunities to learn about their senses</u> • Exploring the natural environment with their senses Autumn walk • Exploring objects using their senses e.g. smelling pots, feely bags, listening pots etc. Use a blindfold to focus on senses other than sight? Describing feely bag items etc. • Sorting collections of natural objects using their senses e.g. bark, pebbles, feathers, seeds, cones, leaves, sticks • Looking closely at natural objects using a magnifying glass or app on a tablet – curiosity cube. • Going on a sound walk • Playing guessing games where children pick an object and either describe it or are asked questions in order to identify it • Playing listening games • Sharing books about senses and sensory impairments • Tasting food - Spanish food International Week</p>
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Science Enquiry

	<p>Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.</p>	
	<p>Research Using secondary sources of information to answer scientific questions.</p>	
	<p>Observation over time Observing changes that occur over a period of time ranging from minutes to months.</p>	<p>How does a baby change over time? Research using secondary sources Find out about the human life-cycle from an expectant mother, parent with a baby and elderly person.</p>
	<p>Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</p>	
	<p>Identifying, grouping and classifying Making observations to name, sort and organise items.</p>	<p>Classification - Sort images of humans according to their age. Sort using different senses. Which do you like/not like?</p>

<p>Common Misconceptions Some children may think: •babies are in a mummy's stomach.</p>	<p>Vocabulary: grow, change, baby, toddler, child, adult, old person, smell, taste, touch, feel, hear, see, blind, deaf Supplementary vocabulary to be exposed to: life cycle, senses, elderly, die (if appropriate)</p>	<p>Books and Rhymes Grandpa by John Burningham Handa's Surprise by Eileen I don't want to wash my hands, Poem-Michael Rosen Brown, We're going on a leaf hunt. Mo (A Great Big Cuddle) Poem,Mudlarks Shirley Hughes</p>
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Science in Nursery – Living things and their habitats

<p>Key Learning Explore the surrounding natural environment Explore natural objects from the surrounding environment</p>	<p>Understanding the World Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Begin to understand the need to respect and care for the natural environment and all living things.</p>	<p>Links with other areas of learning Mathematics Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'. Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. Extend and create ABAB patterns – stick, leaf, stick, leaf. Expressive Arts and Design Create closed shapes with continuous lines, and begin to use these shapes to represent objects. Draw with increasing complexity and detail, such as representing a face with a circle and including details.</p>
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<p>Sticky Knowledge: I know the name of objects in my collection (shell, feather, stones, acorn, conker, leaf etc.) and I can describe the objects, including patterns I notice on them. I know that natural objects have come from plants and animals. I know I do not damage the living things that encounter in the natural environment. (Care of God's Creation) I know how to show care and I can encourage others to care for things they encounter in the natural environment. (Care of God's Creation)</p>	<p>How it is achieved at our school: <i>Opportunities to explore the surrounding natural environment</i></p> <ul style="list-style-type: none"> • Going on local nature walks • Identifying natural objects and things left by humans • Gathering natural objects from nature walks to include in a collection for the nature table e.g. stones, leaves, seeds, conkers, pinecones, acorns, twigs, bark, shells, feathers 	<p><i>Opportunities to explore natural objects from the surrounding environment</i></p> <ul style="list-style-type: none"> • Using a magnifying glass or a tablet with an app to observe the natural objects in a collection closely • Drawing natural objects in the collection • Grouping together natural objects that are similar in the collection • Using natural objects to make pictures and patterns - Andy Goldsworthy Land Art
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Science Enquiry

	<p>Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.</p>	
	<p>Research Using secondary sources of information to answer scientific questions.</p>	
	<p>Observation over time Observing changes that occur over a period of time ranging from minutes to months.</p>	<p>Draw natural objects, including some patterns observed on them.</p>
	<p>Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</p>	
	<p>Identifying, grouping and classifying Making observations to name, sort and organise items.</p>	<p><i>Classification</i></p> <ul style="list-style-type: none"> • Find and identify natural objects to include in the collection. • Which natural objects are from plants, animals or neither? <p><i>Grouping</i></p> <ul style="list-style-type: none"> • Group similar objects together

<p>Common Misconceptions Some children may think:</p> <ul style="list-style-type: none"> • shells are only found at the beach • feathers are from dead birds. 	<p>Vocabulary: natural, plant, animal, leaves, seeds, conkers, acorns, twigs, bark, shells, feathers, pebbles, stones, same, different, pattern Supplementary vocabulary to be exposed to: living, dead, similar</p>	<p>Books and Rhymes Percy the Park Keeper by Nick Butterworth Stick Man Fox in the Night-Martin Jenkins The Nature Girls-Delphine Mach The Squirrels big year Baby animals in nests Once I saw a little bird-Poem</p>
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Science in Nursery – Plants

Key Learning Grow plants and care for plants	Understanding the World Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. 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	Links with other areas of learning Mathematics Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. Expressive Arts and Design Create closed shapes with continuous lines, and begin to use these shapes to represent objects. Draw with increasing complexity and detail, such as representing a face with a circle and including details.
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Sticky Knowledge: I know and can describe some differences between seeds and bulbs. I can identify seeds and bulbs. I know how to plant and care for seeds and bulbs and can talk about this. I can explain that a seed or bulb grew into a plant and then died. I know I do not damage the living things that encounter in the natural environment. (Care of God's Creation) I know how to show care and I can encourage others to care for things they encounter in the natural environment. (Care of God's Creation)	How it is achieved at our school: <i>Opportunities to grow plants</i> <ul style="list-style-type: none"> • Visiting a garden centre • Gathering seeds from the surrounding natural environment • Gathering seeds from fruit • Observing collections of seeds and bulbs using a magnifying glass or an app on a tablet • Drawing seeds and bulbs • Planting and caring for seeds and bulbs <ul style="list-style-type: none"> • Growing vegetable tops • Observing and photographing/drawing how plants grow and die • Observing and photographing/drawing what happens when fruit, vegetables and flowers are left to decay • Gathering seeds and digging up bulbs of the plants they grow • Designing seed packets • Using what they grow to make food to eat • Sharing books about plants and growing plants
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	<i>Comparative testing</i> <ul style="list-style-type: none"> • Compare how quickly different seeds/bulbs germinate. • Compare how different vegetable tops grow.
	Research Using secondary sources of information to answer scientific questions.	<i>Researching using secondary sources</i> <ul style="list-style-type: none"> • Look at seed and bulb packets to learn how to plant and care for them.
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	<i>Observing over time</i> <ul style="list-style-type: none"> • How does a plant change as it grows? • What happens to fruit, vegetables and flowers when left over time?
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	

Common Misconceptions Some children may think: <ul style="list-style-type: none"> • trees are not plants • there is a young plant inside a seed or bulb • bulbs are big seeds • big plants grow from big seeds and big bulbs • fruit and vegetables come from the supermarket • plants grow at night or when we are not watching them. 	Vocabulary: plant, leaf, stem, trunk, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil Supplementary vocabulary to be exposed to: seedling, healthy, unhealthy, strong, sturdy, wilting, decay, mould, life cycle	Books and Rhymes
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Science in Nursery – Materials, including changing materials

Key Learning Explore a range of materials Shape and join materials Combine and join materials Combine and mix ingredients Change materials by heating and cooling, including cooking	Understanding the World Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about the differences between materials and changes they notice.	Links with other areas of learning Expressive Arts and Design Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures.
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Sticky Knowledge: I know the name of the material I am using (cardboard, wood, metal etc.) I know one property of a material and can talk about it (hard, soft etc.) I know that mixtures change when ingredients are added and can talk about this. I know that materials change when cooked and can talk about this. I know that materials change when heated and can talk about this. I know that materials change when frozen and can talk about this.	How it is achieved at our school: <i>Opportunities to explore a range of materials in a sensory way especially through touch, including more unusual materials</i> • Exploring oobleck (cornflour and water), gellibaff, shaving foam, foam burst shower gel etc. <i>Opportunities to shape and join materials</i> • Building junk models using a range of materials • Shaping and joining materials using equipment e.g. scissors, hole punch, including when using wood e.g. a hammer and nail <i>Opportunities to change materials</i> • Making smoothies • Mixing ingredients to make playdough, cakes, biscuits, bread, jelly etc. • Melting chocolate for decorating bakes/biscuits or to combine with other ingredients e.g. refrigerator cake, chocolate crispy cakes • Comparing cooked and uncooked pasta, noodles, rice or potatoes • Cooking popcorn in a microwave • Cooking cakes, biscuits, bread etc. • Making ice lollies and ice-cream • Using medical ice packs including self-activated cool pads • Removing toys from ice • Adding baking soda and fizzy bath bombs to water • Adding coloured sweets to water • Adding currants to fizzy water/lemonade • Adding bicarbonate of soda to vinegar to make a bubbling potion
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	
	Research Using secondary sources of information to answer scientific questions.	
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	<i>Observing over time</i> • How does the cake mixture change? • How does chocolate change when heated? • How does fruit juice change when put in the freezer? • How does fruit change when blended?
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	<i>Classification</i> • Sort materials using simple properties.

Common Misconceptions Some children may think: • a material is better to use because it is 'bigger' not thicker, rigid etc. • the material is 'box' not cardboard.	Vocabulary: mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, soft, bendy, stiff, wobbly, wood, plastic, paper, card, fabric Supplementary vocabulary to be exposed to: solid, liquid, rigid, stronger, weaker	Books and Rhymes Pat a Cake Biscuit Bear
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Science in Nursery – Electricity

Key Learning Identify electrical devices Use battery-powered devices	Understanding the World Explore how things work.	Links with other areas of learning	
Sticky Knowledge: I know and can identify devices that use batteries. I know and can identify devices that use mains electricity. I know how to switch battery-powered devices on and off. I know what electrical devices do and can talk about it.		How it is achieved at our school: <i>Opportunities to identify electrical devices</i> <ul style="list-style-type: none"> Spotting devices that are plugged into power sockets in the classroom Spotting devices that use batteries in the classroom Sorting objects/photographs of objects according to whether they use electricity or not Sorting objects/photographs of objects according to whether they use batteries and/or mains electricity. Looking at shopping catalogues that include electrical devices <i>Opportunities to use battery-powered devices</i> <ul style="list-style-type: none"> Using Bee-Bots, shopping tills, torches, remote control cars, talk cards/recording devices, hand-held fans, metal detectors <i>Opportunities to talk about how electrical devices work</i> <ul style="list-style-type: none"> Describing what the devices do e.g. make a sound, make light, move Suggesting that batteries may need charging or replacing when a device does not work 	
Science Enquiry			
	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.		
	Research Using secondary sources of information to answer scientific questions.		
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.		
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.		
	Identifying, grouping and classifying Making observations to name, sort and organise items.		<i>Classification</i> <ul style="list-style-type: none"> Identify objects that use electricity to work. Identify devices that use batteries and/or mains electricity
Common Misconceptions Some children may think: <ul style="list-style-type: none"> all batteries can be recharged rechargeable devices do not have batteries. 		Vocabulary: battery, plug, socket, electricity, wire, sound, light, move Supplementary vocabulary to be exposed to: mains electricity, device, appliance, electrical	Books and Rhymes



Science in Nursery – Light

Key Learning Explore light sources Shine light on or through different materials	Understanding the World Explore how things work. Talk about the differences in materials and changes they notice.	Links with other areas of learning	
Sticky Knowledge: I know different light sources and can name them. I can describe and compare the brightness of light sources. I know that some materials are reflective and non-reflective. I know that some materials that block light and can identify them I know that I can see my own reflection in some objects.		How it is achieved at our school: <i>Opportunities to explore light sources</i> <ul style="list-style-type: none"> • Switching light sources on and off • Comparing the brightness of light sources • Using different light sources in dark dens with reflective and fluorescent stickers <i>Opportunities to shine light on or through different materials</i> <ul style="list-style-type: none"> • Shining light on or through different objects and materials e.g. reflective, non-reflective, transparent, translucent, opaque, coloured filters, holographic paper, glitter ball • Looking at their reflection in different types of mirrors e.g. plane, convex, concave and wobbly • Looking for their reflection in other objects • Making glitter pictures or pictures with reflective materials 	
Science Enquiry			
	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	<i>Comparative testing</i> <ul style="list-style-type: none"> • Compare how bright different light sources are. • Compare how reflective different materials are. 	
	Research Using secondary sources of information to answer scientific questions.		
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.		
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.		
	Identifying, grouping and classifying Making observations to name, sort and organise items.	<i>Classification</i> <ul style="list-style-type: none"> • Which materials are reflective to use for an outside mobile? • Which fabrics are reflective to help us be seen at night? • Which materials block light to help us protect ourselves from the Sun? 	
Common Misconceptions Some children may think: <ul style="list-style-type: none"> • light is only found in bright places • shiny objects are light sources • the moon is a light source 		Vocabulary: light, torch, bulb, lamp, spotlight, shiny, bright, brighter, brightest, Sun, shine, glow, mirror Supplementary vocabulary to be exposed to: light source, reflective, non-reflective, dim, dimmer, dimmest	Books and Rhymes Can't You Sleep Little Bear by Martin Waddell



Science in Nursery – Forces

Key Learning Feel forces Explore how things work Explore how objects/materials are affected by forces	Understanding the World Explore how things work. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice	Links with other areas of learning Expressive Arts and Design Join different materials and explore different textures.
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Sticky Knowledge: I know that some objects float and sink and can identify these objects. I know that the shape of some objects can be changed and talk about how I changed their shape. I can describe what they feel when exploring magnets. I can describe what they feel and see when pushing, pulling, bending and twisting objects e.g. springs, elastics, wind-up toys, gears, pulleys etc. I can describe what they feel when riding bikes and scooters on different surfaces and ramps.	How it is achieved at our school: <i>Opportunities to feel forces</i> <ul style="list-style-type: none"> • Pushing floating objects under water e.g. balloons, table tennis balls etc. • Exploring magnets of different shapes and sizes • Encourage children to push floating objects under water and talk about how it feels the further they push the object under the water. • Encourage children to talk about what happens when they release an object under the water. • Exploring springs of different sizes, both compression and extension springs • Using bikes and scooters on different surfaces and ramps <i>Opportunities to explore how things work</i> <ul style="list-style-type: none"> • Testing a range of objects to find out if they float or sink • Playing games that contain springs e.g. bagatelle • Playing with wind-up toys • Racing wind-up toys • Playing with gears and pulleys e.g. sets of gears, large playground pulleys etc. • Playing with magnetic toys e.g. train carriages joined by magnets, magnetic construction kits etc. <i>Opportunities to explore how objects/materials are affected by forces</i> <ul style="list-style-type: none"> • Pushing, pulling, twisting and bending malleable (e.g. modelling clay, playdough, springs, pipe cleaners, elastics, sponges etc.) and nonmalleable objects/materials • Cutting and joining objects/materials e.g. wood, building kits with nuts and bolts etc.
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	<i>Comparative testing</i> <ul style="list-style-type: none"> • Compare the path of different wind-up toys. • Compare how far different wind-up toys move. • Compare the speed and direction of gears. • Compare how easy or hard it is to lift an object with or without a pulley. • Compare how easy it is to ride a scooter or bike on different surfaces.
	Research Using secondary sources of information to answer scientific questions.	
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	<i>Classification</i> <ul style="list-style-type: none"> • Sort objects according to whether they float or sink. • Sort objects/materials according to whether their shape can be changed.

Common Misconceptions Some children may think: <ul style="list-style-type: none"> • big objects sink and heavy objects sink • an object such as an ice cube which is partially submerged is floating and sinking at the same time. 	Vocabulary: object, float, sink, water, up, down, top, bottom, push, pull, magnet, spring, squash, bend, twist, stretch, turn, spin, smooth, rough, fast, slow Supplementary vocabulary to be exposed to: rising, falling, attract, repel, faster, slower, pulley, gear, elastic	Books and Rhymes Wind the Bobbin Up
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Science in Nursery – Sound

Key Learning Listen to sounds Make sounds	Understanding the World Explore how things work	Links with other areas of learning Expressive Arts and Design Use drawing to represent ideas like movement or loud noises. Listen with increased attention to sounds. Respond to what they have heard, expressing their thoughts and feelings. Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures.
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Sticky Knowledge: I know that some objects make sounds. I can recognise and describe the sounds made by different objects.	How it is achieved at our school: <i>Opportunities to listen to sounds</i> <ul style="list-style-type: none"> • Listening to the sounds around them at different times and in different places • Playing listening games • Listening to recordings of different sounds and identifying what they are • Listening to visiting musicians • Making artwork based on the sounds that they hear • Recording sounds they hear <i>Opportunities to make sounds</i> <ul style="list-style-type: none"> • Making sounds using their bodies • Singing songs and rhymes • Exploring toys and other objects that make a noise • Hitting different objects with beaters of different materials to notice the different sounds they make • Playing musical instruments • Making and playing musical instruments e.g. shakers drums, guitars, kazoos and rainmakers etc. • Recording the sounds they make
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	
	Research Using secondary sources of information to answer scientific questions.	
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	<i>Comparative testing</i> <ul style="list-style-type: none"> • Compare the sound produced by shakers made with different materials. • Compare the sound produced by different drums. • Compare the sound produced by different elastic bands on their 'guitar'

Common Misconceptions Some children may think: <ul style="list-style-type: none"> • for a sound to be heard the listener has to actively concentrate on it first • sounds travel only to someone who is listening for them • sounds cannot go through obstacles • volume and pitch are the same thing • not all sounds are caused by vibrations. 	Vocabulary: sound, noise, loud, quiet, high, low, music, bang, blow, pluck, soft, hard, fast, slow, names of instruments Supplementary vocabulary to be exposed to: musician, notes, vibrate, vibration, pitch, rhythm, pulse, volume	Books and Rhymes The Wheels on the Bus Old MacDonald had a Farm
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Science in Reception – Animals, excluding humans

Key Learning Name and describe animals that live in different habitats Describe different habitats	Understanding the World Recognise some environments that are different to the one in which they live.	Links with other areas of learning Physical Development Revise and refine the fundamental movement skills they have already acquired: rolling; crawling; walking; jumping; running; hopping; skipping; climbing
Sticky Knowledge: I know that animals live in different habitats and I can name and describe them. I can describe different habitats.		How it is achieved at our school: <i>Opportunities to learn about animals from a different habitat</i> <ul style="list-style-type: none"> • Sharing books about animals in the local area and animals in other countries e.g. jungle, polar regions, desert, ocean • Looking at pictures of animals in different habitats • Watching videos of animals in different habitats • Playing games involving matching animals to their habitats • Playing with small world animals in different habitats • Visiting the zoo, focusing on animals that live in different habitats • Caring for pets from a different habitat e.g. tropical fish • Creating pictures of animals in their habitats • Pretending to be animals • Naming and describing animals they see in books, pictures, videos or while on a trip • Describing different habitats

Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	
	Research Using secondary sources of information to answer scientific questions.	<i>Researching using secondary sources</i> <ul style="list-style-type: none"> • Learn how animals from a different habitat are cared for. • Learn about animals in a different habitat.
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	<i>Classification</i> <ul style="list-style-type: none"> • Sort animals according to where they live

Common Misconceptions Some children may think: <ul style="list-style-type: none"> • animals are furry and have four legs • a bee is not an animal because it is an insect • animals adapt to their surroundings, e.g. a brown bear turns white and becomes a polar bear • animals living in the soil breathe by coming to the surface • dragons and other mythical creatures are real animals 	Vocabulary: names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice Supplementary vocabulary to be exposed to: environment, polar regions, ocean, camouflage	Books and Rhymes Lost and Found- Oliver Jeffers I love my Home- Sebastian Braun Tadpoles Promise- Jeanne Willis & Tony Ross Old MacDonald
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Science in Reception – Humans

<p>Key Learning Describe people who are familiar to them Learn about how to take care of themselves</p>	<p>Understanding the World Talk about members of their immediate family and community. Name and describe people who are familiar to them.</p>	<p>Links with other areas of learning Personal, Social and Emotional Development See themselves as a valuable individual. Manage their own needs. Physical Development Know and talk about the different factors that support their overall health and wellbeing; regular physical activity; healthy eating; tooth brushing; sensible amounts of 'screen time'; having a good sleep routine; being a safe pedestrian. Further develop the skills they need to manage the school day successfully: lining up and queuing; mealtimes; personal hygiene. Mathematics Compare length, weight and capacity.</p>
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<p>Sticky Knowledge: I can describe themselves, family, friends and community. I know my distinguishing features and can draw pictures of myself, family, friends and community. I can talk about what they see when using a mirror. I know how to compare hand, foot and fingerprints and can talk about how they are different. I know how I look after myself and how other people look after me.</p>	<p>How it is achieved at our school: <i>Opportunities to describe people who are familiar to them</i></p> <ul style="list-style-type: none"> • Talking about themselves, friends, family and community using photographs • Using mirrors to look at their faces • Creating pictures or collages of themselves, friends, family and community • Making hand and footprints using paint • Making fingerprints using ink pads <p>Using a 'magic' mirror which shows everything about them and getting children to describe themselves and how they are special</p> <ul style="list-style-type: none"> • Sharing books about different types of families <p><i>Opportunities to learn about how to take care of themselves</i></p> <ul style="list-style-type: none"> • Demonstrating and talking about how they look after themselves • Talking about other people that look after them • Talking to a dentist, nurse, meal supervisor/school cook, road crossing supervisor etc. • Sharing videos of people who care for us and how we look after ourselves
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Science Enquiry

	<p>Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.</p>	
	<p>Research Using secondary sources of information to answer scientific questions.</p>	<p><i>Researching using secondary sources</i> Find out information from visitors (dentist, nurse etc.).</p>
	<p>Observation over time Observing changes that occur over a period of time ranging from minutes to months.</p>	
	<p>Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</p>	<p><i>Pattern seeking</i> Are taller children faster? Are taller children stronger?</p>
	<p>Identifying, grouping and classifying Making observations to name, sort and organise items.</p>	<p><i>Grouping</i> Sorting humans by their characteristics. <i>Classification</i> Sort images of people according to their characteristics.</p>

<p>Common Misconceptions Some children may think: • sons look like their fathers and daughters look like their mothers.</p>	<p>Vocabulary: hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (blue, brown, green, grey), skin (black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman Supplementary vocabulary to be exposed to: bald, elderly, wrinkles, male, female, freckles</p>	<p>Books and Rhymes Once there were Giants – Martin Waddell Happy in our Skin – Fran Manushkin Hands by Julia Donaldson</p>
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Science in Reception – Living things and their habitats

Key Learning Explore the plants in the surrounding natural environment Explore animals in the surrounding natural environment Explore plants and animals in a contrasting natural environment	Understanding the World Draw information from a simple map. Explore the natural world around them. Describe what they see, hear and feel whilst outside. Recognise some environments that are different to the one in which they live.
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Sticky Knowledge: I know the name of plants and animals in the school grounds and local environment and can describe them. I know how another environment is different to my surrounding natural environment. I know that I do not damage the living things that I encounter in the natural environment.	How it is achieved at our school: <i>Opportunities to explore the plants in the surrounding natural environment</i> <ul style="list-style-type: none"> • Taking photographs of the plants they find in the school grounds • Observing closely and drawing the plants in the school grounds • Finding plants in the school grounds to match with photographs of them • Looking at aerial views to count the number of trees in the school grounds • Using a map of the school grounds, with pictures of where specific plants can be found, to find those plants • Creating a map to show how to find their favourite plants in the school grounds 	<i>Opportunities to explore the animals in the surrounding natural environment</i> <ul style="list-style-type: none"> • Finding minibeasts in the school grounds • Taking photographs of the minibeasts they find in the school grounds. Matching the minibeasts they find to pictures that identify them • Observing the minibeasts closely, using a magnifying glass or app on a tablet • Drawing pictures of the minibeasts • Creating a map to show where they found each type of minibeast • Sharing books about minibeasts • Playing with small world minibeasts • Building minibeast homes <i>Opportunities to explore plants and animals in a contrasting natural environment</i> <ul style="list-style-type: none"> • Visiting a contrasting natural environment e.g. forest, beach, etc. • Finding and taking photographs of plants and animals in the contrasting natural environment • Sharing non-fiction and fiction books about the contrasting natural environment visited
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	
	Research Using secondary sources of information to answer scientific questions.	
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	<i>Pattern seeking</i> <ul style="list-style-type: none"> • Look for minibeasts in different areas of the school grounds. • Look for plants in different areas of the school grounds.
	Identifying, grouping and classifying Making observations to name, sort and organise items.	<i>Classification</i> <ul style="list-style-type: none"> • Name and describe plants and animals they find in the school grounds.

Common Misconceptions Some children may think: <ul style="list-style-type: none"> • trees are not plants 	<ul style="list-style-type: none"> • trees are not living as they do not seem to change or grow • weeds are bad plants. 	Vocabulary: plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment e.g. beach, forest Supplementary vocabulary to be exposed to: environment Books and Rhymes Home – Carson Ellis, I love my Home – Sebastian Braun, Little Red Riding Hood
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Science in Reception – Seasonal Change

Key Learning Play and explore outside in all seasons and in different weather Observe living things throughout the year	Understanding the World Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.
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Sticky Knowledge: I know that there is different types of weather and can talk about them I know that they are seasons and can talk about the four seasons. I can identify the living things I can see in the playground and on visits during each season.	How it is achieved at our school: <i>Opportunities to play and explore outside in all seasons and in different weather</i> <ul style="list-style-type: none"> • Playing in the rain and snow • Drawing around puddles • Catching rain and hail in buckets • Catching snowflakes on frozen black paper and looking at them with magnifying glasses or an app on a tablet • Making icicles • Using scarves or pinwheels to explore the strength and direction of the wind • Looking at photographs of different seasons and types of weather • Sharing books about different seasons and types of weather 	<i>Opportunities to observe living things throughout the year</i> <ul style="list-style-type: none"> • Sharing books about the seasons • Going on seasonal walks to observe key features of the seasons • Making artwork with seasonal found objects • Visiting a canal or pond to look for birds and their young in spring • Visiting a farm to see the young animals in the spring • Finding minibeasts in the school grounds at different times in the year • Taking photographs of the minibeasts they find in the school grounds at different times in the year • Looking for birds and other animals throughout the year using binoculars • Sharing books and videos about animals that migrate or hibernate over winter, gather food in autumn, build nests and lay eggs in spring etc. • Taking photographs of the plants they find in the school grounds at different times in the year • Observing closely and drawing the plants in the school grounds at different times in the year • Matching animals and plants they find to pictures that identify them
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	
	Research Using secondary sources of information to answer scientific questions.	<i>Researching using secondary sources</i> <ul style="list-style-type: none"> • Find out about how animals behave in different seasons. • Find out about the weather and seasons.
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	<i>Classification</i> <ul style="list-style-type: none"> • Which clothes are suitable for each season? <i>Observing over time</i> <ul style="list-style-type: none"> • How does a puddle change over time? • How does a snowman change as it melts? • How does the natural world change with the seasons?

Common Misconceptions

Some children may think:

- it always snows in winter
- it is always hot in the summer
- all babies and young animals are born in spring
- plants only have flowers in the spring and summer
- animals sleep during winter
- it rains to help the plants grow
- when it is hotter, it is because the Sun is closer
- God controls the weather.

Vocabulary: spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers

Supplementary vocabulary to be exposed to: hibernate, migrate, snowflake

Books and Rhymes

Rain, Rain Go Away
Rain on the Green Grass
It's Raining, It's Pouring
I Hear Thunder
Leaf Man- Lois Ehlert
The Nut Tree (Poem – Julia Donaldson)
Tree: Seasons come, seasons go



Science in Reception – Materials, including changing materials

Key Learning
 Explore a range of materials, including natural materials
 Make objects from different materials, including natural materials
 Observe, measure and record how materials change when heated and cooled
 Compare how materials change over time and in different conditions

Understanding the World
 Explore the natural world around them.
 Describe what they see, hear and feel whilst outside.

Sticky Knowledge:
 I know the name of the material I am using and why.
 I know the multiple properties of the material and why it is suited for its purpose and can talk about this.
 I can observe changes in their natural world and say why it is different now or will change in the future.
 I know that some materials change over time and I can compare and describe how they change.

How it is achieved at our school:
Opportunities to explore a range of materials in a sensory way, including natural materials

- Looking for dew, ice, icicles and frost in the playground
- Using their senses to explore natural materials in the environment, such as stones, twigs, leaves, feathers, seeds, flowers etc.
- Gathering natural materials to make collections
- Opportunities to make objects from different materials, including natural materials
- Making pictures using natural materials they have gathered from the environment
- Making dens, nests, bug hotels etc. using natural materials
- Making ice pictures by putting water in a shallow tray and adding natural objects gathered from the environment and then leaving them outside to freeze or putting them in the freezer
- Making junk models with a range of materials, including natural materials they have gathered from the environment

Opportunities to compare how materials change

- Making popcorn in a microwave and on a fire
- Making pizza dough with different flours
- Baking bread in different tins or for different times to compare the outcome
- Baking cupcakes and removing one after every five minutes
- Choosing where to put ice cubes in the playground and observing how quickly they melt
- Observing how a large block of ice changes over time, using string to measure around it
- Putting wax crayons in different areas of the playground and observing how they change
- Making a snowman and observing how it changes over time
- Making snowballs and putting them in different parts of the playground and observing how they change over time

Science Enquiry



Comparative / fair testing
 Changing one variable to see its effect on another, whilst keeping all others the same.

Comparative testing

- How does popcorn made in a microwave compare to popcorn made on a fire?
- How quickly do ice cubes melt in different areas of the playground?
- How are pizza bases different when made with different flours?
- How does a loaf cook differently in different tins?
- How do cupcakes cook if they have different amounts of mixture?



Research
 Using secondary sources of information to answer scientific questions.



Observation over time
 Observing changes that occur over a period of time ranging from minutes to months.

Observing over time

- How does the block of ice change over time?
- How does a snowman change over time?
- How does cake mixture/bread dough change as it is cooked?

	<p>Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</p>		
	<p>Identifying, grouping and classifying Making observations to name, sort and organise items.</p>		
<p>Common Misconceptions Some children may think:</p> <ul style="list-style-type: none"> • material only means fabric • all plastic/wood etc. is the same. 		<p>Vocabulary: ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back</p> <p>Supplementary vocabulary to be exposed to: solid, liquid, gas, most suited</p>	<p>Books and Rhymes Three Little Pigs The Building Boy – Ross Montgomery Hansel and Gretel</p>



Science in Reception – Light

Key Learning Explore shadows Explore rainbows	Understanding the World Describe what they see, hear and feel whilst outside.	Links with other areas of learning Personal, Social and Emotional Development Manage their own needs.
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Sticky Knowledge: I know identify shadows in the playground. I know when shadows can be seen in the playground. I know how shadows changes during the day and can talk about this. I know the light source and the object making a shadow. I can identify shadows that are dark and pale. I can identify and describe a rainbow.	How it is achieved at our school: <i>Opportunities to explore shadows</i> <ul style="list-style-type: none"> • Looking for shadows created by the Sun on cloudy and non-cloudy days • Drawing around shadows and comparing their shape and size • Making shadows using their bodies, both outside using the Sun and inside using torches • Making shadows using transparent and opaque objects/materials • Putting hands in a beam of light and making shadow shapes • Making shadows using shadow puppets or other objects • Observing a toy outside and noticing how the shadow changes during the day • Observing what areas are sunny and shady at different times in the day • Sharing books about shadows <i>Opportunities to explore rainbows</i> <ul style="list-style-type: none"> • Making rainbows from sunlight e.g. bubbles, water sprinkler, holographic paper, CDs etc. • Sharing books about rainbows
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	<i>Comparative testing</i> <ul style="list-style-type: none"> • Compare the shape of shadows made by different objects.
	Research Using secondary sources of information to answer scientific questions.	<i>Researching using secondary sources</i> <ul style="list-style-type: none"> • Find out about shadows. • Find out about rainbows.
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	<i>Observing over time</i> <ul style="list-style-type: none"> • How do the Sun and shade change during the day? • How does a toy's shadow change during the day?
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	<i>Classification</i> <ul style="list-style-type: none"> • Which objects/materials make dark shadows?

Common Misconceptions Some children may think: <ul style="list-style-type: none"> • shadows are only caused by the Sun • all shadows are black. 	Vocabulary: Sun, sunny, light, shadow, shady, clouds, torch, see-through, non-see through, source, light source Supplementary vocabulary to be exposed to: casting a shadow, pale, dark, transparent, opaque	Books and Rhymes My Colours (Poem- Colin West) A Dark Dark Tale- Ruth Brown
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Science in Reception – Forces

Key Learning Explore how to change how things work Explore how the wind can move objects Explore how objects move in water	Understanding the World Explore the natural world around them. • Describe what they see, hear and feel whilst outside
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Sticky Knowledge: I know how I can change objects to make them float or sink (using cubes in a boat) I can talk about how I changed how cars move down ramps or gutters. I can describe how objects fall with and without a parachute. I can describe how a marble moves through different liquids.	How it is achieved at our school: <i>Opportunities to explore how to change how things work</i> • Adapting objects to see if they can be made to float or sink e.g. cutting and peeling fruit and vegetables, reshaping plasticene etc. • Testing how many small objects different foil containers can hold before sinking • Testing how toy cars move down ramps and gutters • Testing how objects fall with and without a parachute attached • Making and testing paper aeroplanes • Designing different marble runs or routes for water/sand to travel down gutters or pipes	<i>Opportunities to explore how objects move in air</i> • Identifying objects being blown around outdoors • Observing how different objects fall e.g. scarves, feathers • Observing how toys/objects move in the wind e.g. streamers, balloons, pinwheels, bubbles etc. <i>Opportunities to explore how objects move in water</i> • Exploring how a marble moves through different liquids in sealed bottles • Observing how sailing boats move through water
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	<i>Comparative testing</i> • How many cubes/small plastic animals can fit in different 'boats'? • Compare how cars move down ramps/gutters. • Compare how objects fall. • Compare how objects fall with and without parachutes. • Compare how things move when blown. • Compare how a marble moves through different liquids. • Compare how different paper aeroplanes fly
	Research Using secondary sources of information to answer scientific questions.	
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	

Common Misconceptions Some children may think: • all light objects float and all heavy objects sink • objects made of the same material will always float or sink.	Vocabulary: float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow, bounce Supplementary vocabulary to be exposed to: force, rotate, solid, liquid, gravity	Books and Rhymes Jabari Jumps- Gaia Cornwall Up and Down- Oliver Jeffers
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Science in Reception – Sounds

Key Learning Listen to sounds outside and identify the source Make sounds	Understanding the World Describe what they see, hear and feel whilst outside.
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Sticky Knowledge: I know that objects make sounds. I can describe sounds they hear. I can an identify the source of sounds. I can describe how they make sounds.	How it is achieved at our school: <i>Opportunities to listen to sounds outside and identify the source</i> <ul style="list-style-type: none"> • Going on a sound walk • Closing eyes and listening to the sounds around them when outside • Listening to rain, wind, thunder • Recording sounds when outside • Playing sound identification games • Catching rain in metal buckets or saucepans 	<i>Opportunities to make sounds</i> <ul style="list-style-type: none"> • Making noise by blowing on a blade of grass • Making wind chimes • Using voices, instruments and other objects to mimic sounds they hear outdoors
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	Comparative testing • How does rain sound different when it lands in different containers?
	Research Using secondary sources of information to answer scientific questions.	
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	Observing over time • Listen to the siren of an emergency vehicle as it approaches and moves away.
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	
	Identifying, grouping and classifying Making observations to name, sort and organise items.	

Common Misconceptions Some children may think: • sounds do not travel through solids and liquids.	Vocabulary: sound, noise, listen, hear, music, voices, bird song, traffic, sirens, thunder, high, low, loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar Supplementary vocabulary to be exposed to: source, crescendo, vibration, pitch	Books and Rhymes One Coconut, Two Coconuts Pass the Secret Round The Sound Collector (Poem- Roger Mcgough)
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Science in Reception – Earth and Space

Key Learning Learn about the Earth, Sun, Moon, planets and stars Learn about space travel	Understanding the World Explore the natural world around them. Describe what they see, hear and feel whilst outside.
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Sticky Knowledge: I can identify the Sun, Moon and stars and talk about how they are different from Earth. I know the differences between day and night. I know some animals are active at night and can talk about them. I can talk about some differences between being on Earth and travelling in space.	How it is achieved at our school: Opportunities to learn about the Earth, Sun, Moon, planets and stars <ul style="list-style-type: none"> • Observing that the Sun appears to move across the sky • Observing that it is warmer and brighter when the Sun is shining than when it is behind the clouds • Observing that they can see the Moon at night and sometimes in the day • Observing that they can only see the stars at night • Making model planets e.g. with papier-mâché or Modroc and balloons • Modelling a cratered moon landscape with papier-mâché or Modroc • Observing distant objects, including the Moon, with binoculars or a small telescope • Sharing books and video clips about the Earth, Sun, Moon, planets and stars • Talking about what happens and what they can see and hear in the daytime and at night • Sorting small world animals into those that are active in the daytime and those that are active at night <i>Opportunities to learn about space travel</i> <ul style="list-style-type: none"> • Joining materials to make model rockets, Moon buggies/Mars rovers and space stations • Making and testing simple air-propelled card or plastic bottle rockets • Sharing books and video clips about space exploration including video clips of astronauts walking on the Moon and floating in the space station
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Science Enquiry

	Comparative / fair testing Changing one variable to see its effect on another, whilst keeping all others the same.	<i>Comparative testing</i> <ul style="list-style-type: none"> • Make and testing air-propelled rockets to find out which is the 'best'.
	Research Using secondary sources of information to answer scientific questions.	<i>Research using secondary sources</i> <ul style="list-style-type: none"> • Find out about the Solar System, stars and space travel. • Find out about nocturnal animals.
	Observation over time Observing changes that occur over a period of time ranging from minutes to months.	
	Pattern-seeking Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	<i>Pattern seeking</i> <ul style="list-style-type: none"> • Find simple patterns in how light levels and temperature change with the movement, or obscuring of, the Sun.
	Identifying, grouping and classifying Making observations to name, sort and organise items.	

Common Misconceptions Some children may think: <ul style="list-style-type: none"> • the Earth is flat • the Moon and Sun are discs • stars are a pointed 'star' shape • the Moon appears only at night • at night, the Sun is turned off • at night, the Sun goes behind the clouds 	Vocabulary: Sun, Moon, Earth, star, planet, sky, day, night, space, round, bounce, float Supplementary vocabulary to be exposed to: sunrise, sunset, astronaut, astronomer, constellation, orbit, nocturnal, slow-motion, magnify	Books and Rhymes Twinkle, Twinkle Little Star Whatever Next! by Jill Murphy Here we are – Oliver Jeffers Look Up! – Nathan Bryan How to Catch a Star – Oliver Jeffers Look Inside space (Non- fiction)
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