



Science

Curriculum Map



PORTWAY INFANT SCHOOL

Science INTENT

At Portway Infant School, we believe that all children have the right to an exciting and engaging science curriculum, which enables children to build on their natural **curiosity** and to shape it into scientific enquiry. We nurture inquisitive minds to go from wondering 'what if?' to 'let's find out'. This enables us to support the children to build a successful **cultural capital** for their future.

We scaffold learning and skills so that children develop their understanding of the world around them with a critical eye, as well as building the confidence needed to carry out their own experiments. Science includes observing changes over a period of time, noticing patterns, making links as well as grouping and classifying things. Children explore, collect evidence and test their own hypotheses. Science is about asking good questions, suggesting possible explanations, and then testing them to see if they make sense.

At Portway, we ensure that skills and **vocabulary** are built upon and developed from EYFS to the end of Key Stage 1. We aim to develop these skills to a suitable level both in preparation for Key Stage 2 and beyond that, to understand the uses of Science in the future.

By the end of their Portway journey, our aim is to develop children who are independent, confident, **creative** and enthusiastic young Scientists who enjoy scientific learning and discovery.

Pupils will be taught to:

Develop the foundations for understanding the world through the wonder of Science.

Develop a sense of excitement and curiosity about natural phenomena.

Work Scientifically; this includes:

- ☐ Sensory exploration
- ☐ Identifying and classifying
- ☐ Predicting, testing, and talking about findings
- ☐ Gathering and recording data
- ☐ Comparing

Build Scientific knowledge as set out in our Science Curriculum.

Use links with our local family community to develop our children's understanding of real-world everyday Science (Science capital).

Build Scientific vocabulary. This includes:

- ☐ Asking and answering questions
- ☐ Explaining

Learn through our local environment throughout the year, using the focus of our school grounds to support this.

Learn mostly through first-hand experiences with some use of secondary sources.

Use our enabling environment for enquiry-based learning. This includes:

- ☐ Early Years 'Exploration Stations' and Key Stage 1 'Investigation Stations' in classrooms
- ☐ Our outdoor spaces and Forest School

Enjoy reading high quality books and a **love of reading** to support learning in Science

EYFS The Natural World

Development Matters (Non Statutory) Reception Year Early Learning Goals (Statutory) End of Reception	How?	When?	Vocabulary
Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter	<u>Engage – Woodland Walk</u> Arrange a woodland walk to look for signs that autumn is coming. Encourage the children to use the Autumn spotting sheet to record what they can see. Provide digital recording equipment for the children to take photographs of any wildlife they see. Encourage the children to use their senses on the walk to describe what they can see, hear, smell and touch – links with history (UW) <u>Develop 1 – exploring leaves</u> Provide leaves at various stages, including green leaves, ones that are changing colour, brown crispy leaves, decaying leaves and if possible, leaf skeletons. Use torches	Autumn 1 Baseline	Autumn Growth Change Season Decay Autumn Growth Change Season

Explore the natural world around them, making observations and drawing pictures of animals and plants.	so that the children can see the veins and patterns. Explain that the lines in the leaves are veins. Explore the different shapes and colours of the leaves. Leaf rubbings <u>Develop 1 – who lives in the woods?</u> Display the Woodland and non-woodland animal picture cards on a table top. Challenge the children to name any familiar animals. Ask 'Who lives in the woods?' Invite the children to share their thoughts before sorting the cards into two groups: woodland animals and non-woodland animals. Encourage the children to listen to everyone's ideas before coming to a collective decision. <u>Develop 3 – Wild Ones</u> Show the children the Wild animals video. Explain that these animals are wild and different from pets. Show the children the Wild animals picture cards. Encourage them to talk about the animals using adjectives to describe their size, shape, fur, feathers, claws and beaks. Ask the children to choose their favourite animal about which to sketch or write.		decay veins body part wings rabbits badgers foxes birds beak woodland non-woodland wild animals fur feather claws beaks
Explore the natural world around them, making observations and drawing pictures of animals and plants.			
Sort and group materials and resources and talk about how they are similar or different.	<u>Develop 3 - Peas</u> Read the story The Princess and the Pea. Explain that they have been given the job to find the best material to make a comfortable bed for the princess. Allow the children to handle a range of materials including cotton wool, felt, hessian, bubble wrap, wadding and foam. Encourage them to describe how each of the materials feel. Then give each child a small dried pea to put underneath the materials, showing them how to press down to test.	Autumn 2 Marvellous Me and My Community Kings and Queens	Compare Group Shape Material Colour Test Shiny

Explore the natural world around them Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. Test their ideas	Show the children the <u>Night owls video</u>. Encourage them to listen carefully to the information. Afterwards, display the <u>Owl picture cards</u> and ask the children to describe the owls and talk about the special features they have to help them see in the dark. Provide oil pastels and black paper for children to draw owl pictures while looking carefully at the photographs. <u>Engage – Winter wonderland</u> Watch the <u>Winter wonderland video</u> and discuss together the things that are associated with winter, including weather, animals, clothing and food. After watching the video, display a browsing box with a bird feeder, hat, gloves and scarf and the <u>Winter picture cards</u> – link to history (UW) <u>Develop 1 – Frozen</u> Provide ice and set the children a challenge – to keep some frozen and melt others. Encourage them to think of places to put the ice to complete the challenge and support them to share ideas, ask questions and build on each other's suggestions. Offer a range of materials, including bubble wrap and silver foil, in which the ice can be wrapped. You could even provide salt for the children to see the effect it has on the ice.		asymmetrical ears features wings Cold Winter Season Ice Frost Snow Investigation Test Ice Solid Water Liquid Freezing Melting
Explore the natural world around them, making observations and drawing pictures of animals and plants.	<u>Develop 1 – herbivore or carnivore</u> Display the <u>Carnivore and herbivore picture cards</u>. Invite the children to discuss the prehistoric animals that they are familiar with and describe them. Recap on the word's carnivore and herbivore and their meaning. Provide the children with two hoops and label them with carnivore and herbivore. Ask the children to sort the dinosaurs into the correct hoop and explain their reasoning.	Spring 2 Land of the Dinosaurs Over the Rainbow	Herbivores Carnivores Plants Animals Sort Extinct

Develop scientific knowledge through play activities, sharing stories and non-fiction books and discussion. Explore the natural world around them, making observations and drawing pictures of animals and plants.	<u>Develop 1 – It's raining</u> Fill clear cups with water and add a layer of shaving foam on top. Tell the children that they are going to experiment to observe how it rains. Explain that clouds are made from large collections of tiny water droplets and that the shaving foam in the cup is going to represent a cloud. Provide pots with blue or black food colouring to be the water droplets in the cloud. Invite the children to use pipettes to put drops of the colouring on top of the shaving foam. Encourage them to predict what might happen to the coloured water. <u>Develop 1 – Is it waterproof?</u> Talk to the children about the clothes that they wear on a rainy day and why. Explain that umbrellas and some clothes are made with waterproof materials to keep us dry. Display a range of fabrics, pipettes or spray bottles and water. Invite the children to feel the different fabrics and talk about whether they think they are waterproof or not. Give the children time to test their ideas using the spray bottles and pipettes. When they have finished their test, invite the children to sort the fabrics into two hoops labelled waterproof and not waterproof.		Rain Water droplets Weather Clouds Experiment heavy Materials Waterproof Fabric Test Experiment Observe
Explore the natural world around them, making observations and drawing pictures of animals and plants.	<u>Develop 1 – animals from around the world</u> Display the Animals around the world picture cards. Invite the children to talk about the animals and identify any features they have in common. Ask the children to explain where they think the animals might live and why. As a group, choose one of the animals and use tablets or computers to find interesting facts. You could write the facts on a large sheet of paper to share with the rest of the class.	Summer 1 What a Wonderful World! Spilsh Spolsh	Animals Body parts Features Wild animals Domestic animals

Explore the natural world around them, making observations and drawing pictures of animals and plants.	<u>Develop 3 – Under the same sky</u> Share the story <i>Under the Same Sky</i> by Britta Teckentrup. Explain that even though animals and habitats worldwide might look different, they have lots of similarities. Encourage the children to discuss the different animals and habitats shown in the book. Display the Comparing animals picture cards that show animals indigenous to the United Kingdom and similar animals from around the world		Habitats Animals Compare Parrot Blackbird Cow Buffalo same
Share their creations, explaining the process they have used.	<u>Develop 1- floating and sinking</u> Display the Boats picture cards and ask the children to describe the different types of boat. Offer a range of junk modelling materials, including plastic trays, containers and bottles, foil trays, tape, glue and sticky tack. Tell the children that they are going to create model boats and test them to see how well they float. Ask the children to float their boats on the water without any marbles or coins, before adding them one at a time to see how many it can hold before sinking.		floating sinking boat materials testing
Develop scientific knowledge through play activities, sharing stories and non-fiction books and discussion.	<u>Develop 1 – hydration</u> Leave a houseplant in a pot without water for a few days so that the soil is dry and the plant begins to wilt. Show the children the plant and invite them to explain what has happened. Ask them what they can do to help the plant to survive and grow. Provide watering cans and spray bottles filled with water for the children to help revive the plant		Food Air water survive plant
Knows some similarities and differences between the natural world and contrasting environments	<u>Develop 1 – who lives on the seashore?</u> Introduce the children to different seashore habitats, including the beach, cliffs, rock pools and the sea. When the children have explored the book to find out about the various animals on the seashore, display the Seashore animals picture cards, and invite them to name as many seashore animals as possible. Invite them to describe the	Summer 2 At the Seaside New Beginnings	Sand Stone Rock Shell Habitat Compare

Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps. Explore the natural world around them, making observations and drawing pictures of animals and plants.	different animals that live on the seashore and compare their features. Explain that you will create a seashore mural or display to show the different habitats and animals that can be found there. <u>Develop 1 – Looking after our beaches</u> Read Clem and Crab by Fiona Lumbers. Use the story to discuss how litter can affect the animals that live on beaches. Display types of litter found on the seashore. Include items made from different materials, such as plastic, metal, wood, rubber, foam, ceramic and fabric. Ask the children 'What material is this? How might this litter hurt an animal or the environment? <u>Develop 1 – who lives in a rock pool?</u> Display the Rock pool picture cards and explain that a rock pool is a habitat for different seashore animals and plants. Support the children to read the labels and explore the various plants and animals in a rock pool. Explain that even though sea anemones look like plants, they are animals. They sting fish or crabs with their tentacles and then drag them into their mouths to feed on them. You could use a computer or tablet to look up facts about rock pool animals or watch videos that show rock pool habitats. Provide drawing resources and give each child a Rock pool template. Explain that they will draw and label the different plants and animals that live in a rock pool. <u>Develop 2 – something fishy</u> Display the Fish picture cards. Explore their different features and how these features help them survive. Introduce them to vocabulary, such as scales, fin, gills, eyes, tail and mouth. Support the children to spot each fish's different features. Explain that fish use gills to breathe in the water. Fish use their tails for swimming and fins to		Recycling Litter Harmful Environment Protect Rockpool Crabs Fish Sea anemones Habitat Label Fish Gill Fins Tails Scales Eyes
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Explore the natural world around them, making observations and drawing pictures of animals and plants.

keep them upright and steer through the water. Provide the children with paper and drawing resources and invite them to choose one fish to draw.

Mouth
Breath
Underwater

Key Stage 1 Science

Working Scientifically

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use their observations and ideas to suggest answers to questions.
- Gather and record data to help in answering questions.

In Year 1 Pupils will be taught to:

Plants	Animals including humans	Everyday Materials	Seasonal Changes
Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.	Distinguish between an object and the material from which it is made	Observe changes across the four seasons
Identify and describe the basic structure of a variety of common flowering plants, including trees.	Identify and name a variety of common animals that are carnivores, herbivores and omnivores.	Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock	Observe and describe weather associated with the seasons and how day length varies.
	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).	Describe the simple physical properties of a variety of everyday materials	
	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Compare and group together a variety of everyday materials on the basis of their simple physical properties.	

Year 1 Science

Year 1 Science			
Department for Education Statutory Guidance		How?	When?
Plants	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	Use magnifying glasses to observe and compare a variety of seeds, noting similarities and differences.	Into the Forest Summer 1
	Identify and describe the basic structure of a variety of common flowering plants, including trees.	Plant sunflower seeds. Observe changes over time. Ask simple questions. Using their observations and ideas to suggest answers to questions. Walk around the school grounds. Identify tree parts. Ensure that children know a tree is a plant. Tree hunt around the school grounds identifying deciduous and evergreen trees. Use magnifying glasses to observe and compare leaves, noting similarities and differences. Sort and classify leaves according to their qualities (evergreen and deciduous). Label the parts of a tree. Plant hunt around the school identifying common wild and garden plants. Label the parts of the plant. Perform a simple test - conduct pine cone investigation.	Taught in addition at various points throughout the year, including in Forest School.

Animals, including humans	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Look at some familiar animal species, such as spiders or dogs. Talk about the similarities and differences between animals of the same species, comparing their sizes, colouring, patterns and features. Gather and record data to help answer questions. Conduct a class eye survey and a pictogram. Butterfly hunt – collect, sort and see which butterfly was camouflaged the best. Identify and classify animals into groups by what they eat. Identify and name common animals that are carnivores, herbivores and omnivores. Identify and name birds, reptiles, amphibians, mammals and fish. Classify animals by sorting into Venn diagrams. Learn the BRAMF song. Invite a variety of pet animals into school. Visit to the Yorkshire Wildlife Park. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Label the senses. Perform simple tests to investigate the senses.	Bustling Cities Spring 2 Fur, Feathers & Scales Summer 2
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Everyday Materials	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.	Match a material to it's name. Name the object and the material it is made from. Describe the properties of everyday materials by stating whether it is hard/soft, stretchy/not stretchy, transparent or opaque. Identifying and classifying whether objects are hard or soft. Ask simple questions and perform a simple test to investigate the strength of a material - which would be best for Spiderman's suit? Using their observations and ideas, suggest answers to questions. Gather and record the data to answer the question. Use simple equipment – pipettes to perform a simple test to investigate whether a material is waterproof or not and whether it would be a suitable material for a superhero suit. Ask simple questions and perform a simple test to investigate which material is the most absorbent.	Boom, Pow, Shazam Spring 1
Seasonal Changes	Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.	Seasons walks regularly around school. Notice seasonal changes in Forest School. Complete a weather chart, recording temperature, hours of daylight and weather across all 4 seasons. Draw an Autumn tree. Name and describe how some animals adapt in winter. Ask simple questions.	Life as a Child Autumn 1 Taught in addition at various points throughout the year, including in Forest School.

		Using observations and ideas to suggest answers to questions Gather and record data to help in answering questions. Perform a simple test. Observe closely using simple equipment. Make a rain gauge and record how much rain falls over a wet period of time. Observe changes over the 4 seasons by sorting and classifying clothes worn in each season. Observe and describe how day length changes across the year. Use the data to produce a pictogram – record data to help answer questions.	
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Vocabulary	Working Scientifically	observe, changes, patterns, grouping, sorting, compare, same, different, identify (name), measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying
	Animals, including Humans	head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue
	Everyday Materials	object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy,, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through, properties
	Seasonal Changes	weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length, daylight, rain gauge, temperature
	Plants	leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area

In Year 2 Pupils will be taught to:

Plants	Animals, including humans	Everyday Materials	Living Things & their Habitats
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.	Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify that most living things live in habitats to which they are suited. Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including micro-habitats. Describe how animals obtain their food from plants and other animals. Understand a simple food chain, and identify and name different sources of food.

Year 2 Science

Year 2 Science		
Department for Education Statutory Guidance	How?	When?
Working Scientifically	asking simple questions and recognising that they can be answered in different ways observing closely, using simple equipment	Bar graphs for material uses (maths link – data handling)
	performing simple tests	Testing materials
	identifying and classifying	Answering questions such as Can you record how many pieces of different cargo you boat can carry before it sinks?
	using their observations and ideas to suggest answers to questions	Projectile investigation – which would damage a castle wall the best?
	gathering and recording data to help answer questions.	What shapes are important when building a strong bridge? (Maths link – shapes)
		Fact File for a burrowing animal of their choice
		Investigating senses - Explore a range of garden herbs using all the senses.
		Work in groups to create a short presentation about conditions needed for plant growth. Practise reading a sentence or two each as part of the presentation, concentrating on speaking with clear and audible voices.

All Aboard! Autumn 1

Magnificent Monarchs Summer 1

Perfect Plants Summer 2

Plants	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.	Find out how plants and flowers transport water by creating a rainbow of flowers. Carefully place the stems of white carnations in coloured water and watch what happens. Explain what they have observed using simple scientific vocabulary. Explore a range of cacti of different shapes and sizes. Group them according to their features and talk about why they have sorted them in a particular way. Find out their different features, characteristics and the conditions they need to grow well. Use a range of information sources, such as books, leaflets and the web and record findings in different ways. Allestree Park, Forest School and grounds, walks to name and describe flowers and trees	Perfect Plants Summer 2
Animals, including humans	Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Burrowing animals -Learn about tunnelling animals such as moles, rabbits and ants. What physical features help them to do this? Identify and name a variety of animals in their habitats, including microhabitats. Importance of exercise, cleanliness and healthy eating Pond dipping and bug hunting trip Allestree Park	Magnificent Monarchs Summer 1 Marvellous Minibeasts Spring 2

Everyday Materials	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Investigate and find uses of every day materials Suitability of materials for a boat Squashing bending stretching twisting materials Explore how much cargo a toy boat or raft can carry before it sinks. Hidden treasures in ice, what is the best way to get them out? What materials would be good to use for a strong bridge?	All Aboard! Autumn 1
	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		Magnificent Monarchs Summer 1

Living Things & Their Habitats

Explore and compare the differences between things that are living, dead, and things that have never been alive.

Identify that most living things live in habitats to which they are suited.

Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

Identify and name a variety of plants and animals in their habitats, including micro-habitats.

Describe how animals obtain their food from plants and other animals.

Understand a simple food chain, and identify and name different sources of food.

Vocabulary	Working Scientifically	observe, changes, patterns, grouping, sorting, compare, same, different, identify (name), measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, hand lens, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying, researching using secondary sources
	Everyday Materials	opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching
	Animals, including Humans	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)
	Living Things and their Habitats	living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied
	Plants	light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling