



Science: Whole-School Curriculum Map

At St. Joseph's, we want to ensure that every child can access a broad and balanced Science curriculum which enables them to confidently explore and discover what is around them so that they can develop a deeper understanding of the world we live in. We want to equip our children with not only the minimum statutory requirements of the Science National Curriculum but also prepare them for the opportunities, responsibilities and experiences of later life. In order to achieve this, we incorporate a range of exciting, practical experiences and encourage scientific curiosity and questioning.

We have a coherently planned and sequenced curriculum which has been carefully designed and developed with the need of every child at the centre of what we do. Where possible, we strive to make meaningful links with topics taught in other subjects such as Geography and History. Our school grounds provide a beautiful, stimulating outdoor learning environment where much of the curriculum can be enhanced through practical activities. Our specialist Environmental Tutor visits each Wednesday afternoon to provide an outdoor, nature-themed workshop to all classes on a rota basis every half term.

The *Switched on Science* scheme of work is used as a starting point for planning and teaching Science but we have adapted and enhanced it in order to meet the needs of our children as well as to utilise our local area. With investigative learning at its core, our Science offering at St. Joseph's ensures that pupils have ample opportunities to

develop their understanding of the topics whilst also deepening their enthusiasm for this wonderful and crucial subject.

Pre-Nursery (2-year-old provision)

In our 2-year-old provision, children are introduced to Science through the natural world and hands-on experiences. This includes: seasonal activities, weekly woodland walks, cooking every week to explore how things change, gardening and learning how to look after living things such as plants and the chickens. They also access the mud kitchen and tuff trays with seasonal resources.

Additional Science learning opportunities:

Autumn 1 & 2:

- I can explore and respond to different natural phenomena, such as the change of the seasons (autumn).

Spring 1:

- I can explore and respond to different natural phenomena, such as the change of the seasons (winter)

Spring 2:

- I can explore and respond to different natural phenomena, such as the change of the seasons (spring).
- I can explore natural materials outside.

Summer 1:

- I can explore materials with different properties.

Summer 2:

- I can explore and respond to different natural phenomena, such as the change of the seasons (summer)

Nursery	Learning Objectives	Scientific and safety skills	Key vocabulary	Other 'Development Matters' statements covered in this half-term
Autumn 1				
Sound Collectors	- To develop an understanding of sound, including that we hear sounds with our ears - To manipulate sound to make it louder and quieter, higher and lower	- Experience activities to support their developing ideas that different materials make different sounds - Some children will begin to recognise that when a sound is made something vibrates	collect, collector, drums, ears, hear, hearing, high, instrument, loud, loudest, low, music, musical, musician, noise, pattern, quiet, quietest, record, senses, sound	I can talk about what I was like when I was a baby.
Autumn 2				
Mud Glorious Mud	- To develop an understanding of soil as a natural material, which, when water is added, changes its consistency and properties - To explore this by adding more or less water or soil and other materials such as sand, pebbles and parts of plants - To test their own ideas, for example, 'What will happen if I pour more water in?'	- Create basic safety rules, which include not eating anything in the mud kitchen - Know when to tell an adult if they find anything unusual/unsafe, e.g. a piece of glass	change, liquid, material, mix, mud, ooze, runny, sand, shape, soil, squash, thick, water	- I can use my senses in hands-on exploration of natural materials. - I can talk about environments in stories.
Spring 1				
Pets and Vets	- To recognise that humans are a type of animal that has the same needs as other animals - To think about the importance of exercise, food and health care for all animals.	- Children should be taught to wash hands immediately after handling an animal, including mini-beasts - Know to never touch an animal without an adult's permission	amphibians, animal, birds, fish, healthy, ill, injection, injured, invertebrates, life cycle, mammals, medicine, minibeasts, operation, reptiles, tablet, vaccination, vet, veterinary nurse	I can make observations about my immediate environment.
Spring 2				
The Potting Shed	- To recognise and name a variety of different plants, not only the ones that they grow but native plants that may, as weeds, need to be removed from their garden - To confidently talk about what a plant needs to thrive, including light, water and soil	- Children should be taught to handle and store tools - Know to check with an adult before eating any produce	bulb, compost, dibber, flower, fork, fruit, grow, harvest, leaf, petal, plant, pot, rake, root, root hairs, seed, sepal, soil, spade, stem, trowel, water, weed	I am beginning to notice changes in my environment.

		Remember to wash hands thoroughly after gardening		I can talk about an animal life-cycle.
Summer 1				
Pirates	- To explore floating and sinking, through problem solving to make pirate boats and rafts - To sort and identify materials, through sifting and using magnets - To sort and identify animals, particularly from habitats such as the sea and rainforest	To know that when using a telescope or binoculars, not to look directly at the Sun	binoculars, bow, coins, gold, jolly roger, map, mast, pirates, plank, ship, stern, telescope, treasure, float, sink	I can talk about what I see in the world.
Summer 2				
Dough Babies	To closely observe what happens when the raw ingredients of play-dough are mixed together and heated	- Use senses to compare a mixture at different stages of the process - Begin to communicate observations using simple scientific language	pliable, soft, squash, squeeze, stretch, twist. change, cook, heat, liquid, lumpy, powder, solid, sticky, thicken	I am beginning to talk about and describe changes in my environment.

Reception	Learning Objectives	Scientific and safety skills	Key vocabulary	Other 'Development Matters' statements covered in this half-term
Autumn 1				
Superhero Materials	- To identify everyday materials and describe their physical properties - To distinguish between an object and the material from which it is made	- To sort and group materials - To carry out simple tests and talk about their findings	think, describe, sort, plan, look, watch, measure, test, find out, texture, hard, smooth, properties, waterproof, flexible, see-through, tin foil, fur, fabric, bubble wrap	- I can tell you what a plant needs to grow. - I can explore the natural world. - I know some similarities and differences between the natural world and contrasting environments.
Autumn 2				
Into the Woods	To become familiar with, and be able to name, a growing number of native plants and animals	To use simple secondary sources to discover more about British woodlands	animals, British woodland, fox, rabbit, squirrel, deer, owl, spider, lion, wolf, monkey, native trees, oak, hazel, beech, plants, ivy, bluebells, honeysuckle	I can discuss the changing seasons.
Spring 1				
Zarg's World	- To understand that there are many other planets in our own Solar System and beyond. - To understand that there are some things that scientists currently do not know	- To observe carefully, using all of their senses	astronaut, earth, galaxy, light year, moon, names of planets in our solar system, orbit, planet, rocket, solar system, space, space station, star, sun, telescope	- I can draw similarities and make comparisons between items. - I can ask questions about aspects of my familiar world.
Spring 2				
Dinosaurs	- To develop an understanding of grouping dinosaurs according to criteria such as teeth, claws, spikes and wings - To develop their ability to find out information about dinosaurs, including their habitat, camouflage and ideas about how they became extinct	Identifying, classifying and grouping	armour, bones, coprolite, dinosaurs, dinosaur poo, earth, eggs, excavate, extinct, footprints, fossils, magnifying glasses, maps, museum, paintbrushes, palaeontologist, papier mâché, fossils, skeleton, spikes, swamp, tail, trees	I can talk about why things happen.

	To know that dinosaurs existed because people have found their remains as fossils, bones and fossilised dinosaur poos			
Summer 1				
Food of the Seasons	- To develop an understanding of how the changing seasons have an impact on when food is at its best and cheapest to buy because it is in season - To understand the importance of a healthy and varied diet to human health - To learn how food is grown and prepared and its importance to our survival	- Know that hygiene is of prime importance when cooking - Ensure that all equipment used for cookery is not used for anything else - Understand the importance of washing hands frequently while handling food and also to avoid touching their face during a cooking activity - Know that clean aprons should also be worn to prevent food being contaminated by any dirt on clothing - To use table knives to cut a variety of foods including bananas, cucumber and bread	bake, boil, chop, cut, dice, fruit, grate, shred, slice, steam, vegetable, wash	- I can understand the key features of the life-cycle of an insect. - I can show care and concern for living things in the environment. - I can start to develop an understanding of growth decay and change over time. - I can talk about some of the things I have observed such as plants, animals, natural and found objects.
Summer 2				
Biscuit Bears	- To learn how mixing materials (ingredients) and heating them can change a mixture - To identify cause and effect, and explore the forces that can change the shape of dough (e.g. push, pull, twist and stretch) and carry out simple tests	- Know that long hair should be tied back or placed in a hairnet - Understand the importance of washing hands frequently while handling food and also to avoid touching their face during a cooking activity - Observe changes in dough as it bakes by using senses to identify changes in colour, size, shape and smell	cook, cool, dry, heat, ingredients, touch, taste, smell, sense, wet	- I can talk about the properties of materials. - I can talk about ways in which I can look after the environment. - I understand some important processes and changes in the natural world including the seasons and changing states of matter.

Year 1	Brief overview	National Curriculum statements covered	Working scientifically skills developed	Key vocabulary
Autumn 1				
Who Am I? (NC: Animals, including humans)	Children will learn about the basic parts of the human body and explore their five senses.	- Identify, name, draw and label the basic parts of the human body - Say which part of the body is associated with each sense	- Observe closely, using simple equipment - Identify and classify - Gather and record data to help in answering questions	backbone, chin, ears, elbow, eyes, socket, fingers, foot, feet, head, hear, hearing, hip, human, joints, knee, leg, neck, nose, ribs, see, senses, sight, smell, spine, taste, thigh, toes, tongue, touch, vertebrae, wrist
Autumn 2				
Plants and Animals Where We Live (NC: Plants; Animals, including humans)	Children explore their local environment (school grounds and/or local park) to find out about the plants and animals that live in their locality. Children will learn to name and identify common plants and trees, so they are familiar with their names and are able to use these in Year 2 and beyond.	- 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 - 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	- 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	amphibians, animal, birds, warm-blooded, fish, flowers, habitat, identify, mammal, plant, reptile, stem, tree, buds, feed, leaves, live, nest, plants, sort, tree, twigs
Spring 1				
Polar Places (NC: Animals, including humans; Everyday materials)	In this topic, children plan an expedition to the polar regions, learning about properties of different materials, and a range of living things in the polar regions.	- Identify and name a variety of polar animals - Identify and name common animals that are carnivores, herbivores and omnivores - Describe and compare the structure of a variety of common animals - Describe the simple properties of a variety of everyday materials	- Ask simple questions and recognise that they can be answered in different ways. - Perform simple tests - Identify and classify - Use their observations and ideas to suggest answers to questions	Arctic, Antarctic, carnivore, flexible, habitat, herbivore, omnivore, waterproof, adventurer, Antarctic, Arctic, carnivore, clothes, cold, explorer, freeze, frozen, ice, icebergs, North Pole, penguin, polar bear, sea lion, seal, snow, South Pole,

		Compare and group together a variety of everyday materials on the basis of their simple properties		warm, waterproof, whale, weather
Spring 2				
Marvellous Materials (NC: Everyday materials)	This topic explores various types of materials and their properties.	- 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	- Observe closely, using simple equipment - Identify and classify - Perform simple tests - Use observations and ideas to suggest answers to questions - Gather and record data to help in answering questions	illuminate, opaque, reflect, translucent, transparent, shadow, sound, source, of, sound, vibration, bark, battery, bright, bulb, candle, cool, dark, dull, fast, flame, flower, fruit, high, hot, leaf, leaves, light, liquid, loud, low, mirror, observe, plant, quiet, root, senses, shoot, slow, solid, texture, torch, wax, wick
Summer 1				
On Safari (NC: Plants; Animals, including humans)	Children go 'on safari' to explore invertebrates and other plants and animals in the school grounds and local areas. It is carried out in the summer months as there is a greater abundance of invertebrates for children to observe.	- 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. - Identify and name a variety of common animals that are carnivores, herbivores and omnivores.	- Ask simple questions and recognise that they can be answered in different ways - Observe closely, using simple equipment - Perform simple tests - Identify and classify - Gather and record data to help in answering questions	abdomen, antennae, detritivore, exoskeleton, food, chain, habitat, head, insect, invertebrate, thorax, vertebrate, eyes, jointed, key, legs, metamorphosis, pond, sections, thorax
Summer 2				
Holidays (NC: Seasonal changes; Animals, including humans;	Children will plan what they need to pack for a holiday, and explore the different animals they might encounter at the seaside. Discuss the human impact on the environment. Vote where	- Observe changes across the four seasons - Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals - Observe and describe weather associated with the seasons and how day length varies	- 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 observations and ideas to suggest answers to questions	habitat, marine biologist, sunburn, animals, banded, wedge, shell, beach, cockle, fish, habitat, limpet, mussel, periwinkle, shell, pollution, protect, razor, clam, recycle, rock, pool, rubbish, sand, sea,

Everyday materials)	in the UK or the world children would like to visit and work with the most popular, researching where it is, climate, food, etc.	- 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	Gather and record data to help in answering questions	shell, shell, crab, sun, sunglasses, sunscreen, turtles
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Year 2	Brief overview	National Curriculum statements covered	Working scientifically skills developed	Key vocabulary
Autumn 1				
Healthy Me (NC: Animals, including humans)	In this topic, children explore the importance of exercise, diet and good hygiene, building on the 'Who am I?' topic in Year 1.	- Find out about and describe the basic needs of humans for survival (water, food and air) - Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene - Notice that humans have offspring which grow into adults	- Observe closely - Perform simple tests - Identify and classify - Use observations and ideas to suggest answers to questions - Gather and record data in answering questions	calm, calves, cough, exercise, feed, fitness, food, fruit, germs, happiness, health, healthy, hygiene, hygienic, muscle, needs, sneeze, stomach, thighs, vegetables, physical health, mental health,
Autumn 2				
Little Masterchefs (NC: Animals, including humans; Uses of everyday materials)	This topic explores food, including making healthy food choices, and cooking various different foods. There will also be opportunities for discussion about the uses of everyday materials e.g. metal for pans, wood and plastic for utensils, etc.	- Describe the importance for humans of eating the right amounts of different types of food - Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	- Observe closely, using simple equipment - Perform simple tests. - Identify and classify - Use observations and ideas to suggest answers to questions - Gather and record data to help in answering questions	chopping board, cook, digest, energy, fork, frying pan, grow, heat, hot, hygiene, ingredients, knife, oven, rainbow, saucepan, spoon, strong, temperature, utensils, suitability, classify, food groups, balanced diet, Eatwell plate, fruit and vegetables, carbohydrates, fats and sugars, protein, dairy
Spring 1				
Material Monsters	This topic explores the properties and uses of everyday materials – building on learning	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic,	- Observe closely - Perform simple tests - Identify and classify	absorbent, bend, brittle, bumpy, card, change, concrete, dull, elastic, fabric, flexible, glass, hard, man-

(NC: Uses of everyday materials)	from Year 1. Children will also learn about three inventors of new materials - John Dunlop, John McAdam, and Charles Macintosh.	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	Use observations and ideas to suggest answers to questions Gather and record data in answering questions	made, materials, metal, natural, materials, opaque, paper, plastic, pull, push, recycle, rough, rubber, shiny, smooth, properties, squash, squeeze, twist, stretch, John Dunlop, Charles Macintosh, John McAdam
Spring 2				
Our Local Environment (NC: Living things and their habitats; Animals, including humans)	Children will discover that living things are able to move, breathe, grow, reproduce (in humans, babies), get rid of waste (in humans, 'wee' and 'poo') and eat. They also need to be able to know when something changes, e.g. gets colder, warmer (sensitivity). Children will also learn about habitats and simple food chains.	- Explore and compare the differences between things that are living, dead, and things that have never been alive - Notice that animals, like humans, have offspring which grow into adults - Identify and name common animals that are carnivores, herbivores and omnivores - 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 and minibeasts - Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain - Identify and name different sources of food in food chains	- 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 observations and ideas to suggest answers to questions - Gather and record data to help in answering questions	alive, live, carnivore, dead, food-chain, habitat, herbivore, micro-habitat, never alive, omnivore, predator, prey
Summer 1				
Young Gardeners (NC: Plants)	This topic brings together study of living things and habitats and is strongly focussed on outdoor learning and investigations about	- 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	- Ask simple questions and recognise that they can be answered in different ways - Observe closely, using simple equipment - Perform simple tests - Identify and classify	annual, compost, flower, fruit, germinate, germination, health, healthy, leaf, leaves, plant, root, seed, seedling, soil, stem, bulb

	what plants need to survive.		• Use observations and ideas to suggest answers to questions • Gather and record data to help in answering questions •	
Summer 2				
Scientists and Inventors (NC: Working scientifically – development of skills to prepare for LKS2)	Children will consolidate working scientifically skills that they have learned in Years 1 and 2.	Working scientifically unit	• Ask simple scientific questions • Observe closely, using simple equipment • Perform simple tests • Use observations and ideas to suggest answers to questions	gravity, prism, rainbow, acoustics, brain, reflexes, senses, disease, infection, surgeon, sterile, bacteria, penicillin, light bulb, Sir Isaac Newton, Thomas Edison, Florence Nightingale, Alexander Graham Bell

Year 3	Brief overview	National Curriculum statements covered	Working scientifically skills developed	Key vocabulary
Autumn 1				
Rocks, Soils and Fossils (NC: Rocks)	In this topic children work scientifically on a variety of quick investigations and longer tasks to learn about rocks. It covers the properties and uses of rocks, the rock family, soils and finally fossils.	- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties - Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter	- Ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment - Gather, record, classify and present data in a variety of ways to help in answering questions - Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	mineral, rock, permeable, impermeable, crystals, magma, sediment, sedimentary, humus, fossil, extinct, palaeontology, palaeontologists, granite, igneous, metamorphic, soil, marble, sand, clay, limestone
Autumn 2				
Light and Shadows (NC: Light)	Children work scientifically on a variety of quick challenges and longer tasks to learn about the wonders of light, including reflections and shadows.	- Recognise that we 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 the eyes - Recognise that shadows are formed when the light from a light source is blocked by a solid object - Find patterns in the way that the sizes of shadows change	- Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers and data loggers - Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	light, light source, mirror, observation, opaque, reflect, shadow, translucent, transparent, UV light, shiny, dull
Spring 1				
Food and Our Bodies (NC: Animals, including humans)	This topic looks at where animals get food from and why it is important, and skeletons, muscles and joints.	Identify that animal, including humans, need the right types and amount of nutrition and that they cannot make their own food: they get nutrition from what they eat	- Gather, record, classify and present data in a variety of ways to help in answering questions - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar graphs and tables	balanced, diet, biceps, carbohydrates, contract, exoskeleton, fats, femur, humerus, joint, muscle, nutrients, protein, skeleton, triceps, vertebrate

		- Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	
Spring 2				
How Does Your Garden Grow? (NC: Plants)	In this topic, children will learn about the different parts of plants, what plants need to live, water transportation in plants and pollination.	- Identify and describe the functions of different parts of flowering plants: roots, stem / trunk, leaves and flowers - Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant - Investigate the way in which water is transported within plants - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	- Ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers and data loggers - Gather, record, classify and present data in a variety of ways to help in answering questions - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables - Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - Identify differences, similarities or changes related to simple scientific ideas and processes - Use straightforward scientific evidence to answer questions or to support their findings	carpel, stigma, flower, leaves, life-cycle, nutrients, ovary, ovule, petal, photosynthesis, pollen, pollination, root, root hairs, seed, dispersal, sepals, stamen, stem, style, stigma, veins
Summer 1				
Forces and Magnets (NC: Forces and magnets)	This topic looks at magnets and their uses, and what makes magnetic poles special, along with the idea that some forces such as magnetic force can act	- Compare how things move on different surfaces - Notice that some forces need contact between two objects, but magnetic forces can act at a distance - Observe how magnets attract or repel each other and attract some materials and not others	- Ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate measurements	attract, compass, contact, force, iron, magnet, magnetic, magnetic North pole, non-contact, non-magnetic, prediction, scientific, test, repel

	without contact – unlike pushes and pulls, which require direct contact.	• 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	using standard units, using a range of equipment including thermometers and data loggers • Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	
Summer 2				
Testing Materials (NC: Working scientifically – development of skills)	This topic looks at disposable nappies and provides opportunities for children to ask their own questions and make decisions on how to answer their questions using different scientific enquiry activities.	Working scientifically unit	• Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers and data loggers • Gather, record, classify and present data in a variety of ways to help in answering questions • Ask relevant questions and use different types of scientific enquiries to answer them • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Set up simple practical enquiries, comparative and fair tests • Use straightforward scientific evidence to answer questions or to support their findings	absorb, absorbent, bamboo, cloth, cotton, disposable, elastic, faeces, liquid, material, nappy, plastic, properties, urine, Velcro, waterproof, wood, pulp

Year 4	Brief overview	National Curriculum statements covered	Working scientifically skills developed	Key vocabulary
Autumn 1				
Comparing States (NC: States of matter)	Children will learn about states of matter. They will compare and group materials together, according to whether they are solids, liquids or gases. They will observe that some materials change state when heated or cooled, and they will identify the part played by evaporation and condensation in the water cycle.	- Compare and group materials together, according to whether they are solids, liquids or gases - Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	- Ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - Gather, record, classify and present data in a variety of ways to help in answering questions - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - Identify differences, similarities or changes related to simple scientific ideas and processes - Use straightforward scientific evidence to answer questions or to support their findings	boiling, point, boiling, condensing, evaporation, freezing, freezing point, gas, liquid, matter, material, melting, melting point, solid, temperature, thermometer, water cycle
Autumn 2				
Teeth and Eating (NC: Animals, including humans)	Children learn about digestion and different types of teeth, before moving on to explore deadly predators and their prey, in their exploration of food chains. They work scientifically throughout the topic, using enquiry, practical	- Describe the simple functions of the basic parts of the digestive system in humans - Identify the different types of teeth in humans and their simple functions - Construct and interpret a variety of food chains, identifying producers, predators and prey	- Ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate measurements, using standard units, using a range of equipment, including thermometers and data loggers	anus, canine, carnivores, decay, digestion, enamel, energy, herbivore, incisor, large, intestine, molar, grinding, mouth, nutrients, oesophagus, omnivores, small intestine, stomach

	experiments and hands-on research to answer questions and investigate how we eat, why we eat and what we eat.		● Gather, record, classify and present data in a variety of ways to help in answering questions ● Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables ● Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ● Identify differences, similarities or changes related to simple scientific ideas and processes ● Use straightforward scientific evidence to answer questions or to support their findings	
Spring 1				
Living Things (NC: Living things and their habitats)	This topic teaches the children to recognise that living things can be grouped in a variety of ways. They explore and use keys to identify and name a variety of living things. Finally, they look at how changes to habitats can pose dangers to living things. Whilst most of the work for this topic can be carried out in spring and summer, it is important that children visit the local environment throughout the school year so that they continue to develop their understanding of seasonal changes and how these impact on living things.	● Recognise that living things can be grouped in a variety of ways ● Explore and use classification keys to help with grouping ● Identify and name a variety of living things in their local and wider environment ● Recognise that environments can change and that this can sometimes pose dangers to living things	● Ask relevant questions and use different types of scientific enquiries to answer them ● Set up simple practical enquiries, comparative and fair tests ● Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ● Gather, record, classify and present data in a variety of ways to help in answering questions ● Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables ● Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ● Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	amphibian, bird, centipede, classify, fish, flowering, plant, habitat, insect, invertebrate, key, mammal, young, organism, reptile, vertebrate

			- Identify differences, similarities or changes related to simple scientific ideas and processes - Use straightforward scientific evidence to answer questions or to support their findings	
Spring 2				
What's That Sound? (NC: Sound)	Children will already know many things about sound, even without any formal teaching of it. They will encounter how sounds are made on a variety of instruments and how they can be changed in volume, pitch and over distance. They will explore making sounds on a range of objects that aren't instruments, in order to investigate how sounds are created to make music.	- 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	- Ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - Gather, record, classify and present data in a variety of ways to help in answering questions - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identify differences, similarities or changes related to simple scientific ideas and processes - Use straightforward scientific evidence to answer questions or to support findings	decibels, pitch, sound, sound source, vibrate, vibration, vibrating, volume
Summer 1				
Power It Up (NC: Electricity)	Children revisit some uses of electricity and the importance of safety before	Identify common appliances that run on electricity	Ask relevant questions and using different types of scientific enquiries to answer them	battery, bulb, cell, circuit, current, components, conductor, electricity,

	constructing simple circuits. Understanding how to change a circuit by changing its components makes up the third part of this topic.	- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers - Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery - Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit - Recognise some common conductors and insulators and associate metals with being good conductors	- Setting up simple practical enquiries, comparative and fair tests - Gather, record, classify and present data in a variety of ways to help in answering questions - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables	insulator, mains, socket, rechargeable, switch, terminals, wires
Summer 2				
The Big Build (NC: Working scientifically – development of skills)	In this topic, children learn about building towers and bridges, starting with constructing tall towers, then exploring bridges, next they look at animals as builders and finally engage in researching famous engineers and architects and the structures they built. Children will already know many things about the materials they will encounter, how different materials stretch and their uses. They will use and develop working scientifically skills and understanding through comparative and fair tests, measuring, repeat readings and drawing and reading bar and line graphs.	Working scientifically unit	- Ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate measurements, using standard units, using a range of equipment, including thermometers and data loggers - Gather, record, classify and present data in a variety of ways to help in answering questions - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables - Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - Identify differences, similarities or changes related to simple scientific ideas and processes	structure, tower, Thomas Telford, Isambard Brunel

			● Use straightforward scientific evidence to answer questions or to support their findings	
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Year 5	Brief overview	National Curriculum statements covered	Working scientifically skills developed	Key vocabulary
Autumn 1				
Let's Get Moving (NC: Forces)	In this topic children learn about forces and machines. They start with the force of gravity then study friction forces, including air and water resistance, before investigating how simple machines work.	- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object - Identify the effects of air resistance, water resistance and friction, that act between moving surfaces - Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - Use test results to make predictions to set up further comparative and fair tests - Report, and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - Identify scientific evidence that has been used to support or refute ideas or arguments	air resistance, movement, force meter, friction, gravity, Newton, water resistance, weight, Galileo, Sir Isaac Newton, Albert Einstein
Autumn 2				
Amazing Changes (NC: Properties and changes of materials)	In this topic, the children learn about materials, how they change and which changes are reversible and irreversible. The topic concludes by looking at how these properties are applied in the real world.	- Demonstrate that dissolving, mixing and changes of state are reversible changes - Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - Use test results to make predictions to set up further comparative and fair tests	burning, irreversible / chemical change, reversible / physical change, rust

			- Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentation - Identify scientific evidence that has been used to support or refute ideas or arguments	
Spring 1				
Out of This World (NC: Earth and space)	In this topic, children learn about space. Starting with the Solar System, they look next at how ideas about space have changed over time before they explore what causes us to experience night and day on Earth.	- 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	- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - Use test results to make predictions to set up further comparative and fair tests - Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - Identify scientific evidence that has been used to support or refute ideas or arguments	daytime, geocentric, heliocentric, night-time, orbit, plant, solar system, star, sun, time, zone, Aristotle, Ptolemy, Nicolaus Copernicus, Johannes Kepler
Spring 2				
Circle of Life (NC: Living things and their habitats)	In this topic children look at the life cycles of various species including mammals, amphibians, fish and birds. They also look at and describe the life process of reproduction in plants and animals.	- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird - Describe the life process of reproduction in some plants and animals	- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	asexual, reproduction, bulb, female, fertilisation, gestation, larva, male, metamorphosis, ovary, pistil, pollen, pollinate, pollination, sperm, runners, bulbs, tubulars

			● Use test results to make predictions to set up further comparative and fair tests ● Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ● Identify scientific evidence that has been used to support or refute ideas or arguments	
Summer 1				
Growing Up and Growing Old (NC: Animals, including humans)	In this topic, children look at and describe the changes as humans develop to old age. Pupils draw a timeline to indicate stages in the growth and development of humans and learn about the changes experienced in puberty.	● Describe the changes as humans develop to old age RSE statements covered: ● the importance of respecting others ● the conventions of courtesy and manners ● knowing that in school and in wider society, they can expect to be treated with respect by others, and that in turn they should show due respect to others ● the concept of privacy ● knowing that each person's body belongs to them ● knowing where to get advice e.g. family, school and/or other sources	● Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ● Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ● Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	adolescence, adolescent, adult, arthritis, gestation period, life-expectancy, menstruation, pregnant, puberty, teenager
Summer 2				
Material World (NC: Properties and changes of materials)	In this topic, the children learn about materials and how they change. First, they test properties of materials before looking at how materials dissolve, what a solution is and evaporation. Finally, children compare	● Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets ● Know that some materials will dissolve in liquid to form a solution ● Describe how to recover a substance from a solution	● Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ● Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	dissolve, elastic, electrical conductor, evaporate, filter, flexible, hard, insoluble, mixture, plastic, resistant, rigid, soluble, solution, solvent, thermal conductor

	reversible and irreversible changes.	● Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating ● Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic ● Demonstrate that dissolving, mixing and changes of state are reversible changes ● Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	● Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ● Use test results to make predictions to set up further comparative and fair tests ● Report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ● Identify scientific evidence that has been used to support or refute ideas or arguments	
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Year 6	Brief overview	National Curriculum statements covered	Working scientifically skills developed	Key vocabulary
Autumn 1				
Light (NC: Light)	The topic introduces the concept of light travelling in straight lines. It starts by looking at beams of light and how light travels to enable children to understand how we see things. This understanding is then applied to the production of shadows and starts to look at how light is reflected. The topic then takes the learning into the realm of coloured light and rainbows, using scientific skills to raise and answer questions. It builds on the work carried out in Year 3 on light, shadows and reflection.	● Recognise that light appears to travel in straight lines ● Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye ● Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes ● Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	● Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ● Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ● Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ● Use test results to make predictions to set up further comparative and fair tests ● Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ● Identify scientific evidence that has been used to support or refute ideas or arguments ● Gather and record data to help in answering questions	cornea, iris, lens, light ray, pupil, rainbow, reflection, symmetry, Plato, Ptolemy
Autumn 2				
Evolution and Inheritance (NC: Evolution and inheritance)	Building on what they learned about fossils in Year 3, children find out more about how living things have changed over time. They are introduced to the idea that characteristics are passed from parent to their offspring, but that they are not exactly the same. They should also appreciate that variation over time can make animals more or	● Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ● Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents ● Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	Identify scientific evidence that has been used to support or refute ideas or arguments	adaptation, dinosaur, evolution, fossil, inherited, natural selection, prehistoric, variety, Charles Darwin, Mary Anning

	less likely to survive in particular environments (adaptation). Children look at evolution and Charles' Darwin's theory of natural selection, as well as fossils.			
Spring 1				
Healthy Bodies (NC: Animals, including humans)	In this topic children build on learning from Years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system). It considers life processes that are internal to the body, such as the circulatory system. The impact of lifestyle on bodies, particularly of humans, is also considered. Scientists are continually finding out what is good and bad for us, and their ideas do change as more research is carried out.	- Identify and name the main parts of the human circulatory system - Describe the functions of the heart, blood vessels and blood - Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function - Describe the ways in which nutrients and water are transported within animals, including humans	- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - Use test results to make predictions to set up further comparative and fair tests - Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - Identifying scientific evidence that has been used to support or refute ideas or arguments	addiction, artery, atrium, blood, capillaries, carbon dioxide, deoxygenated, exercise, heart, lungs, oxygen, pulse, respiration, vein, ventricles
Spring 2				
Electricity (NC: Electricity)	This topic builds on the Year 4 work on electricity, taking it into the scientific use of symbols for components in a circuit, as well as considering the effect in more detail of changing components in a circuit. The children have the	- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit - Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on / off position of switches	- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - Record data and results of increasing complexity when using scientific diagrams and labels,	battery, blow, cell, complete, component, electrons, filament, fuse

	opportunity to apply their learning by creating an electronic game.	Use recognised symbols when representing a simple circuit in a diagram	classification keys, tables, scatter graphs, bar and line graphs • Use test results to make predictions to set up further comparative and fair tests • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • Identify scientific evidence that has been used to support or refute ideas or arguments	
Summer 1				
Classifying Living Things (NC: Living things and their habitats)	Children build on their learning about grouping living things in Year 4 by looking at the classification system in more detail. The topic is divided into two units, Children first revisit their knowledge of classification and creating keys, before developing their knowledge by looking at fungi and bacteria. Children also look at the work of Carl Linnaeus, the scientist who first made important the function of naming and classifying to 'identify' organisms.	• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • Give reasons for classifying plants and animals based on specific characteristics •	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Use test results to make predictions to set up further comparative and fair tests • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • Identify scientific evidence that has been used to support or refute ideas or arguments	amphibian, bacteria classification, fauna, flora, fungi, genus, insect, invertebrate, kingdoms, mammal microbe, mould, mushroom, photosynthesis, species, toadstool, vertebrate, Carl Linnaeus, Charles Darwin
Summer 2				

The Titanic (NC: Working scientifically – development of skills)	Children engage in a different approach to their science in this topic. They use their science and link it to an historical event in context; the sinking of the Titanic. This topic is based around applying the working scientifically skills that they have learned so far in their science lessons, to explore some of the scientific concepts behind the Titanic, e.g. floating and sinking. It can be used as a good opportunity to embed, assess and observe working scientifically skills, as well as laying foundations for transition to KS3 Science.	Working scientifically unit	- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Take measurements, use a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations	buoyancy, density, floating, hypothermia, iceberg, sink, thermal insulation, upthrust
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