St. John's CE Primary School
Science Long Term Plan

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Aims:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Early Years Framework and National Curriculum	
Nursery	**Communication and Language** • Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" **Personal, Social and Emotional Development** • Make healthy choices about food, drink, activity and toothbrushing. **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 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. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.

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	• Use new vocabulary in different contexts. **Personal, Social and Emotional Development** • Know and talk about the different factors that support their overall health and wellbeing: o regular physical activity o healthy eating o toothbrushing o sensible amounts of 'screen time' o having a good sleep routine o being a safe pedestrian **Understanding the World** • 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 and Attention** • Make comments about what they have heard and ask questions to clarify their understanding.
ELG – Personal, Social and Emotional Development	**Managing Self** • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
ELG – Understanding the World	**The Natural World** • 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.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS Nursery	Talk about what they can see, using a wide vocabulary. Begins to make sense of their own life-story and family's history.	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with	Begin to understand the need to respect and care for the natural environment and all living things.	Make healthy choices about food, drink, activity and toothbrushing.	Explore how things work. Explore and talk about different forces they can feel.	Understand 'why' questions. " Why do you think the caterpillar got so fat?"

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		similar and/or different properties. Talk about the differences between materials and changes they notice.		Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and animal.		
EYFS Reception	Learn and use new vocabulary during the day. Ask questions to find out more and to check they understand what has been said to them. Describe what they see, hear and feel whilst outside. Seasons - Understand the effect of changing seasons on the natural world around them.	Use new vocabulary in different contexts Know and talk about the different factors that support their overall health and well-being: regular physical activity, healthy eating, toothbrushing sensible amounts of 'screen time,' having a good sleep routine, being a safe pedestrian. Describe what they see, hear and feel whilst outside. Seasons - Understand the effect of changing seasons on the natural world around them.	Articulate their ideas and thoughts in well-formed sentences. Describe what they see, hear and feel whilst outside. Seasons - Understand the effect of changing seasons on the natural world around them.	Explore the natural world around them Describe what they see, hear and feel whilst outside. Seasons - Understand the effect of changing seasons on the natural world around them.	Describe what they see, hear and feel whilst outside. Recognise some environments are different to the one in which they live. Seasons - Understand the effect of changing seasons on the natural world around them.	Describe some events in detail. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. Describe what they see, hear and feel whilst outside. Seasons - Understand the effect of changing seasons on the natural world around them.

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EYFS – scientific enquiry opportunities	Encourage scientific enquiry	Encourage scientific enquiry	Encourage scientific enquiry	Encourage scientific enquiry	Encourage scientific enquiry	Encourage scientific enquiry
	• Classification- Sort images of people according to their characteristics. • Researching using secondary sources- Find out information from visitors (dentist, nurse etc.). • Pattern seeking - Are taller children faster? Are taller children stronger?	• Comparative testing - Compare the shape of shadows made by different objects. • Classification - Which objects/ materials make dark shadows? • Observing over time - How do the Sun and shade change during the day? How does a toy's shadow change during the day? • Researching using secondary sources - find out about shadows. Find out about rainbows. Find out about nocturnal animals.	• Classification - Name and describe plants and animals they find in the school grounds. • Pattern seeking - Look for minibeasts in different areas of the school grounds. Look for plants in different areas of the school grounds.	• Classification - Sort animals according to where they live. • Researching using secondary sources - Learn how animals from a different habitat are cared for. Learn about animals in a different habitat.	• Pattern seeking - Find simple patterns in how light levels and temperature change with the movement, or obscuring of, the Sun. • Research using secondary sources -Find out about the Solar System, stars and space travel. • Comparative testing - How many cubes/small plastic animals can fit in different 'boats'?	• Comparative testing – Make and testing air-propelled rockets to find out which is the 'best'. • Compare how cars move down ramps/gutters. Compare how wheels turn when sand or water is poured through. Compare how objects fall. Compare how objects fall with and without parachutes. Compare how different balls bounce. Compare how things move when blown. Compare how a marble moves through different

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						liquids. Compare how different paper aeroplanes fly.
EYFS Understanding the World – topic themed opportunities	**Home Sweet Home** Humans • Talk about members of their immediate family and community. • Name and describe people who are familiar to them.	**Light and Dark** Light • Describe what they see, hear and feel whilst outside.	**Go Wild** Habitats • 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.	**On the Farm** Animals, excluding humans • Recognise some environments that are different to the one in which they live.	**Traditional Tales** Earth and Space • Explore the natural world around them. • Describe what they see, hear and feel whilst outside.	**When I grow up** Forces • Explore the natural world around them. • Describe what they see, hear and feel whilst outside.
	Working scientifically During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions					

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Year 1	Seasonal Changes • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies	Everyday materials Pupils should be taught to: • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties	Animals including Humans Pupils should be taught to: • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Plants Pupils should be taught to: • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees	Animals Pupils should be taught to: • 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)
Year 2	Animals including Humans Pupils should be taught to:	Living things and their habitats	Uses of everyday materials	Plants Pupils should be taught to:	Animals including Humans

	• notice that humans, have offspring which grow into adults • find out about and describe the basic needs of humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Pupils should be taught to: • explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name	Pupils should be taught to: • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	• 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	Pupils should be taught to: • To understand that animals, including humans, have offspring (babies) which grow into adults. • To compare the stages of the human life cycle. • To recognise the importance of a balanced diet. • To investigate the effects exercise has on the human body. • To understand the importance of good hygiene

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		different sources of food			
	Working scientifically During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording 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 • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.				
Year 3	Animals, including humans Pupils should be taught to: • identify that animals, 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 • identify that humans and some other animals have skeletons and muscles for support,	Rocks and soils Pupils should be taught to: • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Forces and Magnets • compare how things move on different surfaces • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • observe how magnets attract or repel each other and attract some	Plants Pupils should be taught to: • 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,	Light Pupils should be taught to: • 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

	protection and movement	• 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	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 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing	including pollination, seed formation and seed dispersal	• 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
Year 4	Animals, including humans Pupils should be taught to: • 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	Sound Pupils should be taught to: • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds	States of matter Pupils should be taught to: • 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	Living things and their habitats Pupils should be taught to: • recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, 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	Electricity Pupils should be taught to: • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its

		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	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		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

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	Working scientifically During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a 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				
Year 5	Properties and changes of materials Pupils should be taught to: • 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, and describe how to	Earth and space Pupils should be taught to: • 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	Animals, including humans Describe the lifecycle of a human • explain how babies grow and develop • describe the main changes that take place during puberty • investigate the gestation period of different mammals	Forces Pupils should be taught to: • 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	Living things and their habitats Pupils should be taught to: • 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

	recover a substance from a solution • 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	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			
Year 6	Animals, including humans Pupils should be taught to:	Electricity	Living things and their habitats	Light Pupils should be taught to:	Evolution and inheritance

	• identify and name the main parts of the human circulatory system, and 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	Pupils should be taught to: • 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 • use recognised symbols when representing a simple circuit in a diagram	Pupils should be taught to: • 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	• 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	Pupils should be taught to: • 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