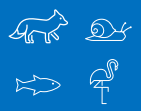
St John's C of E VA First School – Science Long Term Overview

Each year, our children will explore their science learning through six core areas of learning. These are repeated and built upon every academic year.

In each of these areas of learning, children will explore five key scientific concepts, or 'big ideas': The big ideas provide cohesion to the curriculum and are returned to again and again, with links made between different areas of learning.

Animals	Plants	The Human Body	Energy and Forces	Earth and Space	Materials and Matter
					

Energy	Structures and Systems	Changes and Cycles	Cause and Effect	Sustainability
				

In KS1, only the first three are introduced: Energy; Structures and Systems; Changes and Cycles.

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KS2 Science Long-Term Overview

In KS1, we do not have a rolling programme. We have a sequence of learning where the Y1 children have a different specific knowledge focus to the Y2 children. Often the Y2 children will be reminded of their Y1 learning and then taken further focusing on their specific curriculum objectives.

In each of our phase programmes, we have thought carefully about the order we introduce the areas of learning throughout each academic year in order to build knowledge sequentially and make meaningful links between areas of learning.

To ensure every Year 3–4 national curriculum objective is taught without gaps, a two-year rolling programme maps each year group's statutory objectives onto six fixed units.

Mixed-age classes follow the same sequence: Energy and Forces; Animals; Materials and Matter; The Human Body; Plants; Earth and Space - while teachers deliver the objectives relevant to each child's year group.

Working Scientifically (embedded across all units)

- Planning enquiries, controlling variables and choosing appropriate equipment
- Collecting, presenting and analysing data (tables, charts, graphs)
- Drawing conclusions, evaluating methods and suggesting improvements
- Using scientific vocabulary and standard units accurately

We have developed a progression for working scientifically so that all teachers can plan their enquiries within each unit accordingly to their year group.

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Scientific enquiry is a central component of every unit, providing all children with opportunities to apply their knowledge through purposeful, hands-on investigations. Even with a mixed-age class structure, enquiry-based learning is carefully structured to ensure that younger children consolidate foundational skills while older children are challenged to deepen their understanding and refine their approach. Our progression of working scientifically skills is mapped from EYFS to Year 6 in our disciplinary knowledge grid, ensuring that each child builds on prior experiences and moves forward in their scientific thinking. This allows older children to extend their use of scientific vocabulary, design more complex investigations, and critically evaluate evidence, while younger children develop confidence in observation, questioning, and simple testing. This approach ensures that all learners make meaningful progress, regardless of their starting point.

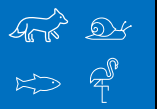
This also shows what is hoped beyond St John's.

Somerset Council	Asking questions and proposing theories	Selecting a scientific enquiry	Carrying out enquiries: planning	Carrying out enquiries: using scientific apparatus correctly	Carrying out enquiries: observing and measuring	Using evidence to draw conclusions and ask new questions
EYFS	Explore the world around them and ask questions with adult support.	Informal exploration of the world around them using the concepts of scientific enquiry implicitly.	Discusses with adults how to find answers to their questions.	Use magnifying glasses and simple pocket microscopes to observe closely.	Informal discussion of comparison using non-standard units.	Discuss with peers and adults what they have found out. Children begin to answer 'how do you know?' questions from adults.
Year 1	Begin to ask simple questions about the world around them.	**A) Research using secondary sources** **B) Grouping and classifying** **C) Observing over time** **D) Noticing patterns** **E) Comparative and fair testing**	Listen carefully as an adult explains how to find answers using types of scientific enquiry- predominantly grouping and classifying and observing closely.	Use magnifying glasses and simple pocket microscopes to observe closely.	With support from adults, record simple data.	Talk about what they have found out during their enquiries.
Year 2	Ask simple questions related to a concept and discuss relevant thoughts and ideas. Recognise that the answers can be reached in different ways.		With adult support, perform simple tests to answer questions.	Use simple timers, such as egg timers to monitor simple tests.	Record simple data in a range of different ways.	Record and communicate findings in a range of different ways and begin to use simple scientific language.
Year 3	Ask a range of questions with different purposes such as discovering answers over time or making links and identifying patterns Begin to consider possible answers to proposed questions.		Set up simple practical enquiries begin to use comparative and fair testing.	Use rulers and simple measuring containers correctly in scientific enquiries. Use a range of data loggers.	Take accurate measurements using standard units for temperature, length and capacity.	Record finidngs using simple scientific language and labelled diagrams.
Year 4	Ask a range of questions to support and to further their understanding of a scientific enquiry. Propose multiple possible outcomes or responses and use scientific reasoning to consider each possible outcome.		Understand which enquiries will help to answer a specific question from across the range of enquiry types and contribute to class discussions around planning their implementation.	Experiment with electrical circuit apparatus, ensuring correct connections. Begin to use thermometers- digital and analogue.	Take accurate measurements using standard units for temperature, length and capacity	Use keys, bar charts and tables to present conclusions and explain in oral and written form. Begin to ask new questions which are raised by the outcomes of scientific enquiries.
Year 5	Devise questions, consider and put forward relevant theories and hypotheses.		Select the most appropriate type of scientific enquiry independently and plan its implementation.	Use of filtering apparatus and apparatus to measure weight.	Taking measurements using a range of scientific equipment with increasing accuracy and precision, taking repeat readings where appropriate.	Include conclusions, causal relationships and explanations of and degrees of trust in results, in oral and written forms such as displays and presentations.
Year 6	Devise questions propose and scrutinise possible theories and identify the type of enquiry most relevant to answer proposed questions Ask further questions based on results.		Plan an appropriate type of scientific enquiry, recognising and controlling variables where necessary.	Use mirrors, torches, safe laser pens and prisms to observe how light travels. Use heart rate monitors to measure pulse.	Explain how to gather and record data accurately using a range of equipment.	Identifying scientific evidence from their enquiries that can support or refute their ideas or arguments. Raise new enquiries based on the data gathered.

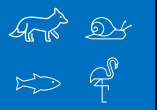
Assessment for learning is seamlessly embedded within every unit. Each topic begins with purposeful opportunities for children to revisit prior knowledge through either structured discussion, concept mapping, or retrieval practice, ensuring that foundational understanding is reinforced and misconceptions are addressed. This approach enables teachers to assess children' starting points and tailor instruction accordingly. Throughout enquiry-based lessons, children apply their knowledge through hands-on investigations, which serve as rich opportunities for formative assessment. As children engage with the working scientifically skills—such as observing, predicting, measuring, and evaluating—teachers gather evidence of understanding and progression. This

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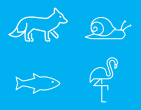
continuous cycle of revisiting, applying, and reflecting ensures that learning is both deep and durable, and that all children are supported to make meaningful progress in their scientific thinking.

KS1			
Term	**Unit**	**Why this? Why now?**	**National Curriculum Programme of Study objectives**
Autumn 1	**Energy and Forces** 	Although Forces is officially a Y3 unit, we feel it is important to introduce these ideas within KS1 to provide the children with an introduction to one of the most important 'big ideas' in science – energy. The children will also use this knowledge as a vehicle for beginning to work scientifically through a range of scientific enquiries. When we define energy as 'the power to make things happen or change', we recognise that energy takes many forms and is a key concept that will be referred to again and again throughout the academic year. Y1 and Y2 children will engage with the concept and the scientific enquiries at the appropriate level. Energy is such a fundamental idea in science that we have chosen to place it as the first unit encountered every academic year. Children will also look at Earth's seasonal changes linked to **plants** and Earth and Space.	
Autumn 2	**Animals** 	We introduce biology to the children through the lens of the variety of animals that live on our planet. To ensure that key classification knowledge is embedded, we split this learning across the year and revisit it later on. We remind the children about the big idea of 'energy' and show how animals are living things which need energy to 'power themselves' which they obtain from what they eat. At the start of the unit, we discuss what makes something alive and we link this with the basic needs of animals. In this unit, we take a different habitat each week (e.g. polar, ocean, rainforest, woodland, desert…) and explore the animals which inhabit them. Y1 children will focus on naming a variety of animals from each habitat and understanding the features of the main classes of animals: mammals, birds, reptiles, fish, and amphibians. Y2 children will follow the same theme but take their learning further by specifically considering how each animal is adapted to their habitat.	**Animals, including humans (Y1)** • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) **Animals, including humans (Y2)** • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) **Living things and their habitats (Y2)** • 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 micro-habitats
Spring 1	**Materials and Matter** 	In this unit, the children will begin by learning that scientists between the object and the material it is made from, and that our world is filled with many different materials all with different properties. They will be introduced to common materials. After this initial introduction, children will explore a different property each week (how it interacts with water, light, heat, pushing and pulling forces) through scientific enquiries. The Y1 children will primarily focus on vocabulary and the Y2 children will take this learning further and consider how these properties make the materials suitable for a specific focus.	**Properties of everyday materials (Y1)** • 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 **Uses of everyday materials (Y2)** • 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.

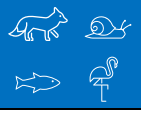
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Spring 2	**The Human Body**		At the start of this unit, we remind the children about the different classes of animals that we learned about in the autumn. We pose the question, 'What are we?' and then explore why humans are a type of mammal in the animal kingdom. The remainder of this unit introduces children to how the human body is structured and what it requires in order to function well. We link this with the big ideas of 'energy' and consider types of food. We come back to the big idea of 'Structures and Systems' and learn about how our senses help us to engage with the world around us. We will also learn about the importance of diet, exercise and hygiene and the effects these have on our bodies.	**Animals, including humans (Y1)** • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense **Animals, including humans (Y2)** • describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene. **Living things and their habitats (Y2)** • 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
Summer 1	**Plants**		The children will have been monitoring changes to the world around them through the seasons since the beginning of the year. Our 'Plants' module is placed in Summer 1 so that the children can understand fully how plants are living things and their cycle and changes they go through. The Y1 children will be introduced to the basic parts of plants and then explore the question, 'Do all plants have…' considering how these same basic parts are evident in many different examples – first in the local area, then returning to a few of the habitats explored in the Animals unit, such as cacti in deserts and seeing the diversity in shape and size of these same few parts. During this unit, the children will consider how these basic parts help the plant to thrive. Children will be introduced through scientific enquiries to how seeds and bulbs germinate and grow into mature plants, and their life cycles.	**Plants (Y1)** • 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. **Plants (Y2)** • 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.
Summer 2	**Animals**		In the second part of the Animals unit, we will revisit the key elements of what it means for an animal to be alive, and the different habitats and animal classes the children explored. In this unit, we will take the learning further. Following this, the Y1 children will learn about animal diet, and specifically herbivores, carnivores and omnivores in a variety of habitats. The Y2 children will consider the idea of simple food chains and how the plants and different animals live together within their ecosystem. The Y2 children will also consider different examples of how the offspring of a variety of animals grow into adults. We link back to the idea of living things reproducing as a basic definition of what it means to be alive. Once this knowledge is gained, the children will conduct a range of scientific enquiries using this knowledge.	**Animals, including humans (Y1)** • identify and name a variety of common animals that are carnivores, herbivores and omnivores **Animals, including humans (Y2)** • notice that animals, including humans, have offspring which grow into adults • **Living things and their habitats (Y2)** • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
Throughout the year	**Earth and Space**		Rather than being blocked, the learning about how the Earth's seasons change and how this looks in the world around us in terms of plants, animals and weather, is returned to one week each half-term. Each half-term, the children will observe changes in their local environment in terms of plants, weather and climate. They will return to photos and data from previous half-terms to make comparisons.	**Seasonal changes (Y1)** • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies

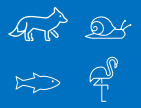
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Year 3/4 Year A				
Term	**Unit**		**Why this? Why now?**	**National Curriculum Programme of Study objectives**
Autumn 1	**Energy and Forces**		As children enter KS2, they are reminded of the big ideas of science and how energy is a fundamental idea that they will encounter in every unit. At the beginning of the unit, they will recap their knowledge of energy and forces. They will then zoom into one particular type of energy: light. They will distinguish between sources of light and objects which just reflect light. They will also explore shadows and how they change depending on different factors. They will then explore electricity as another type of energy by carrying out scientific enquiries linked to circuits. Focused work on electricity allows for further exploration of some of the other big ideas of science. It is when we introduce 'cause and effect' for the first time linked with switches, batteries, etc. There will also be an opportunity to carry out an enquiry around friction forces.	**Light (Y3)** • recognise that they need light in order to see things and that dark is the absence of light • notice that light is reflected from surfaces • recognise that light from the sun can be dangerous and that there are ways to protect their eyes • recognise that shadows are formed when the light from a light source is blocked by a solid object • find patterns in the way that the size of shadows change. **Electricity (Y4)** • identify common appliances that run on electricity • 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
Autumn 2	**Animals**		Children recap their knowledge from KS1 of animal classes and basic food chains. Revisiting the idea of energy, we consider how plants harness the sun's light for their own nutrition and form the basis for all food chains as producers. The children will then explore the flow of energy from producers to predators and see how this works in multiple contexts in different ecosystems. Children will engage in grouping and classifying scientific enquiries based around diet and nutrition. They will be recap the idea that the teeth of a herbivore and a carnivore look different because they have different functions – an idea that was introduced to in more detail in 'The Human Body'.	**Animals, including humans (Y3)** • 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 **Animals, including humans (Y4)** • construct and interpret a variety of food chains, identifying producers, predators and prey **Living things and their habitats (Y4):** recognise that living things can be grouped in a variety of ways
Spring 1	**Materials and Matter**		Children will build on their KS1 knowledge of the basic properties and uses of materials in this unit. In both years of this rolling programme, children will engage in the same core lessons at the start of the unit around the three states of matter: solids, liquids and gases, and the process of changing from one state to another for different materials (e.g. evaporation and condensation with water, melting and boiling points more generally). We have specifically chosen to ensure that these core lessons are covered each year because they are so fundamental. Following these sessions, children will then carry out scientific enquiries which develop their understanding of some of the properties of materials. Following on from the autumn term work on electricity, children will explore the electrical conductivity and insulation of various materials.	**States of matter (Y4)** • 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 **Electricity (Y4)** recognise some common conductors and insulators, and associate metals with being good conductors

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Spring 2	**The Human Body**		The Human Body unit focus on the key learning specifically considering why humans have different types of teeth linked with their omnivorous diet and whether they are a herbivore or carnivore. They will consider teeth as just one part of the wider digestive system and link back to the big idea of 'Structures and Systems' – the digestive system being just one of many in the human body.	**Animals, including humans (Y4)** • 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.
Summer 1	**Plants**		Learning about plants and how they grow and reproduce is foundational to so much other knowledge about ecosystems and nutrition. As such, the knowledge taught in our Plants module is purposefully designed to be the same in both years of the rolling programme so that this core knowledge is learnt deeply. It also provides a good framework for detailing our five big ideas in greater detail, for example: Structures and Systems is where children will take their KS1 learning about parts of a plant into greater depth by considering the functions of all parts and the parts of a flower; Energy is seen through the requirements for growth learning; Changes and Cycles is our focused work on the life cycles of plants including pollination and seed dispersal. There may be planned opportunities to carry out different scientific enquiries and study the same knowledge through different contexts (e.g. different ecosystems) between each academic year.	**Plants (Y3)** • 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.
Summer 2	**Earth and Space**		By the end of the academic year, children have already been introduced to the changing state of water through the Materials and Matter unit. Here, they look in more detail at how these processes drive the water cycle.	**States of matter (Y4)** identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
	Animals		Children will have the opportunity to visit the Earth Science Centre and cover different habitats such as insect and bug hunting in the woods, pond dipping in the lake and making a home for a woodland creature thinking about size and how it needs to protect itself.	**Living things and their habitats (Y4):** • 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.

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Year 3/4 Year B				
Term	**Unit**		**Why this? Why now?**	**National Curriculum Programme of Study objectives**
Autumn 1	**Energy and Forces**		As children enter KS2, they are reminded of the big ideas of science and how energy is a fundamental idea that they will encounter in every unit. At the beginning of the unit, they will recap their knowledge of energy and forces. They will then specifically focus on sound as a type of energy and link it with vibrations, carrying out a variety of scientific enquiries to further their knowledge. Their focused work on forces during this year will be on magnetism and friction, which is then taken further in the Materials and Matter unit later in the year.	**Sound (Y4)** • 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. **Forces and Magnets (Y3)** • 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. • describe magnets as having two poles • predict whether two magnets will attract or repel each other, depending on which poles are facing.
Autumn 2	**Animals**		Children recap their knowledge from KS1 of animal classes and specifically how we define each animal group based on characteristics of bodies, such as skeletons. They will group animals into vertebrates and invertebrates and explore skeletons in a wide range of creatures, noticing similarities and differences. They will specifically consider how different animals' skeletons and muscle systems are adapted for the way in which each animal lives – e.g. strong leg muscles in horses. This learning lays the foundation for learning about muscles and skeletons in more detail in the Human Body unit.	**Animals, including humans (Y3)** • identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Living things and their habitats (Y4):** • 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.
Spring 1	**Materials and Matter**		Children will build on their KS1 knowledge of the basic properties and uses of materials in this unit. In both years of this rolling programme, children will engage in the same core lessons at the start of the unit around the three states of matter: solids, liquids and gases, and the process of changing from one state to another for different materials (e.g. evaporation and condensation with water, melting and boiling points more generally). We have specifically chosen to ensure that these core lessons are covered each year because they are so fundamental. Following these sessions, children will then carry out scientific enquiries which develop their understanding of some of the properties of materials. Following on from the autumn term work on magnetism, children will explore which materials are magnetic and non-magnetic.	**States of matter (Y4)** • compare and group materials together, according to whether they are • solids, liquids or gases **Forces and Magnets (Y3)** • 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 • 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

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Spring 2	**The Human Body**		Children will revisit their work from the Animals unit earlier in the year around muscles and skeletons. They will zoom into more detail about the functions of the musculo-skeletal system in humans and explore examples of bones which support, protect and work together to help the body move. They will also consider the role of nutrition and exercise in maintaining a healthy system.	**Animals, including humans (Y3)** identify that humans and some other animals have skeletons and muscles for support, protection and movement.
Summer 1	**Plants**		Learning about plants and how they grow and reproduce is foundational to so much other knowledge about ecosystems and nutrition. As such, the knowledge taught in our Plants module is purposefully designed to be the same in both years of the rolling programme so that this core knowledge is learnt deeply. It also provides a good framework for detailing our five big ideas in greater details, for example: Structures and Systems is where children will take their KS1 learning about parts of a plant into greater depth by considering the functions of all parts and the parts of a flower; Energy is seen through the requirements for growth learning; Changes and Cycles is our focused work on the life cycles of plants including pollination and seed dispersal. There may be planned opportunities to carry out different scientific enquiries and study the same knowledge through different contexts (e.g. different ecosystems) between each academic year.	**Plants (Y3)** • 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. **Living things and their habitats (Y4)** • 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.
Summer 2	**Earth and Space**		A focus on rocks and fossils at the end of this academic year brings the opportunity to recap on various bits of learning throughout the year. There are lots of opportunities to group and classify rocks based on their characteristics. The children will revisit their work on skeletons when they consider that fossils are the petrified remains of extinct animals and plants. The children will be better able to understand how rocks change from one form into another as they change state between liquids and solids – this builds on the learning from the Materials and Matter unit. By considering the organic components of soil, children will link back and revisit learning from the requirements of plants and how dead organic matter helps to provide nutrition for new living things.	**Rocks (Y3)** • 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.