Curriculum Map
Subject: Science

Intent Statement

At St Nicholas Catholic Primary School it is our intent to deliver a broad and balanced science curriculum that is ambitious, challenging and engaging. At St Nicholas Catholic Primary School, we encourage all children, including those who are disadvantaged or with SEND, to be inquisitive throughout their education and beyond. The Science curriculum fosters a healthy curiosity in children about their immediate environment, and further afield, whilst promoting respect for living and non-living things. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, children will acquire and develop key knowledge that will prepare them for the next step in their education, employment and life.

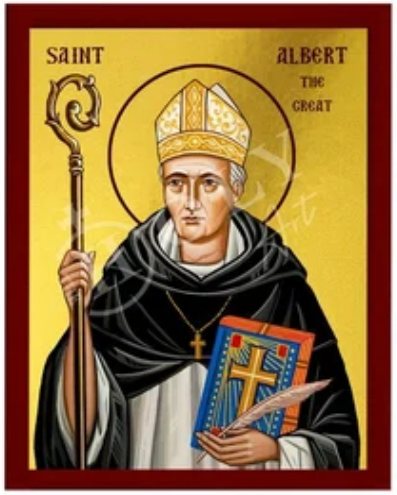
Ensure that 'Working Scientifically' skills are built-on and developed throughout children's education at St Nicholas School. This will allow them to apply their learnt knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts and theories confidently, whilst continuing to ask questions and be curious about their surroundings. Investigations are an important part of our science curriculum. Activities are well-thought through in order to support children in the planning, completion and reviewing of multiple investigations. We aim to develop the children's curiosity whilst encouraging a resilience to adapt thinking when difficulties arise during investigations. It is important to us that children develop an understanding of careers scientists lead, and attributes that they will need to acquire or already possess that will lead them to success.

Patron Saint of Sports is Albert the Great. We ask St. Albert the Great to pray for us.

Albertus Magnus, also known as Albert the Great, was a scholar, philosopher, bishop, and doctor of the Church, as well as the teacher of St. Thomas Aquinas. Canonised in 1931, he was declared the patron saint of the natural sciences, a fitting role considering his tremendous influence in the field.

"The world is not a place of isolation but a place of communion; in it, the beauty of God's creation is reflected."

This quote speaks to St. Albert's belief in the interconnectedness of all things, both in nature and in the divine order. He had a deep respect for the natural world and saw it as a reflection of God's grandeur and wisdom.



Year group	Autumn	Spring	Summer
Reception	**Show care and concern for living things and the environment.**	**Look closely at similarities, differences, patterns and change.**	**Find similarities and differences in relation to places, objects, materials and living things. Make observations of animals and plants and explain why some things occur, and talk about changes.**
	Key questions linked to Catholic Social Teaching: **Stewardship**  **How can we look after our planet?**	Key questions linked to Catholic Social Teaching: **Human Dignity**  **How are you unique?**	Key questions linked to Catholic Social Teaching: **Solidarity**  **What can we do to show God we care for His animals?**
	<u>Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills)</u> ★ Children can explore the natural world around them, making observations and drawing pictures of animals and plants. ★ Children 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. ★ Children understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.		

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	**Seasonal changes (Summer to**	**Everyday Materials** Children learn about	**Seasonal Changes (Winter to spring)**	**Animals Including Humans - Animals**		**Plants**

	Autumn) Children learn about the four seasons, with a particular focus on Summer and Autumn. Children will learn how different types of weather can be measured. Children will use a class weather station to observe, measure and record the weather across the seasons. They will also observe changes across the seasons by exploring the signs of autumn and summer. VIPERS - The Seasons VIPERS - The Arctic	everyday materials and will learn to identify and name everyday materials. They will have the opportunity to explore the properties of these materials and carry out a simple investigation to help them decide which material would be most suitable to use for an umbrella. Children apply their knowledge to sort, discuss, label and investigate. VIPERS - Materials	Children learn about spring and winter. Children will continue to use a class weather station to observe, measure and record the weather in different seasons and will start to make comparisons between two seasons, as well as across all four seasons. They will also observe changes across the seasons by exploring the signs of spring and winter through nature and wildlife. A range of learning activities are used in this unit, including observation, discussion and learning outside.	Children learn about five of the groups that scientists use to classify animals: mammals, fish, birds, reptiles and amphibians. They will learn to identify the group an animal belongs to by its according to their group. They will also learn about the different diets animals eat. features and will classify animals VIPERS - Animals **Animals including Humans - Humans** Children will learn about the parts of the human body and have the opportunity to explore the five senses through a simple investigation. Children will use their knowledge from this unit to classify animals according to their own criteria. VIPERS - My Body	Children learn about the structure of plants and trees and what they need to grow well. Children engage in a variety of activities including identifying plants and trees in the local area and how plants can be grouped. VIPERS - Nature VIPERS - Growing VIPERS - Gardens and Plants
	Key questions linked to Catholic Social Teaching:	**Key questions linked to Catholic Social Teaching:**	**Key questions linked to Catholic Social Teaching:**	**Key questions linked to Catholic Social Teaching:**	**Key questions linked to Catholic Social Teaching:**

	Human Dignity- How can we look after God's creation of the Animals? What makes each of the animals special?	**Common Good**- Why is it important to recycle paper? Participation- How can we use God's materials to make things in the world? How can we be more considerate of God's creation by using different materials?	**Stewardship-** Why did God create seasons? How can we look after God's creation?	**Human Dignity**- How can we look after God's creation of the animals? What makes each of the animals special? **Solidarity**- How can we look after God's creation of the animals? What makes each of the animals special?	**Stewardship**- Why did God create plants? How do plants help us to stay alive? How can we look after the plants in our environment?
	<u>Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills)</u> ★ Use simple equipment to help them make observations ★ Perform a simple test. Describe/ explain what they have done? ★ Identify and classify things they observe. Explain what they have found out ★ Gather and record data to help in answering questions. ★ Record findings to using pictures, labels and captions, chart, table, or using ICT				

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	**Animals Including Humans - birth, growth, change and needs** Children learn about how humans and other animals are born, grow and change, and what we need to survive and	**Must be Au 2** **Uses of everyday Materials** Children learn about the uses of everyday materials including wood, plastic, metal, glass, brick, paper and cardboard. Children then go on to compare the suitability of different everyday materials for different purposes. They explore how		**Must be Sp 1** **Living things and their habitats** Children learn about a variety of habitats and the plants and animals. They learn to tell the difference between things that are living, dead and things that have never been alive. They	**Plants** Children closely study plants and trees in the natural environment, taking measurements and making observational drawings. Children plant a seed and a bulb and compare them as they grow. They record changes in their plants in words and pictures, take measurements throughout the unit	

	be healthy. Children classify different kinds of animal babies, learn about the basic needs that are shared by humans and animals, and research the differing needs of animals within our care.	objects made of some everyday materials can change shape and how the recycling process is able to reuse some everyday materials numerous times. A range of learning activities are used in this unit including, discussions, debates, sequencing and a local walk where children work scientifically to identify the uses of everyday materials in the local area.	make observations of a local habitat and the creatures that live there, investigating conditions in local microhabitats and how they affect the minibeasts found within them.	and finally draw bar charts to show the growth of the two plants. Children set up a comparative experiment to observe what plants need to grow well, and watch the germination process first hand by growing cress. Children begin to learn about plants we eat, and understand that farming involves creating the right conditions for food crops to grow. They will be able to classify some plants and group them accordingly. VIPERS - Nature
	Key questions linked to Catholic Social Teaching: **Human Dignity-** How can we look after God's creation of the animals? What makes each of the animals special?	**Key questions linked to Catholic Social Teaching:** **The Common Good-** Why is it important to recycle paper? **Participation-** How can we use God's materials to make things in the world? How can we be more considerate of God's creation by using different materials?	**Key questions linked to Catholic Social Teaching:** **Stewardship -** How can we look after God's creation of the animals? How can we look after the environment God has given the animals? What makes each of the	**Key questions linked to Catholic Social Teaching:** **Participation-** How can we look after Plants? Why do we give thanks to God for creating plants? Asking God to provide warmth, light and water to allow plants to grow.

		Preferentational of the poor- How do we know that these materials are suitable to look after God's creation? Can we explain why it is important to have these properties just like we have qualities? **Distributive Justice**- How can reusing and recycling materials help everyone in the community get what they need?	are animals special? **Solidarity-** How can we show that we care for all living things and habitats?	
	<u>Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills)</u> ★ Can they use some scientific words to describe what they have seen and measured ★ Can they carry out a simple fair test ★ Can they explain whether things happened as they expected ★ Can they organise things into groups and find simple patterns (or associations) ★ Can they use text, diagrams, pictures, charts, tables to record their observations?			

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	**Must be Au 1** **Forces and magnets** Children will learn about forces, friction and magnetic attraction. They will learn about pushing and pulling forces, and	**Must be Au 2** **Animals Including Humans: Nutrition** Children will learn about the importance of exercise, diet and they will learn that animals cannot make their own food. They will learn that some animals are carnivores,	**Must be Sp 1** **Rocks** Children will discover the different types of rocks and how they are formed. Children will compare and group rocks based on appearance and simple properties. They will learn how fossils are formed and		**Must be Su 1** **Plants** Children will learn the names of different parts of plants, and the jobs they do. The children will work scientifically and collaboratively to	**Light** Children will learn about light, reflections and shadows. They will learn about different sources of light, and that we need light to see. The children will work collaboratively to

	will identify different actions. The children will work collaboratively to investigate friction, by exploring the movement of a toy car over different surfaces. Children will conduct an investigation into the strength of different types of magnet. They will develop their scientific enquiry skills, making observations, predictions and conclusions	omnivores and herbivores. Finally children will learn how nutrients and water are transported around animals. **Animals Including Humans: Skeleton, muscles and Movement** Children will learn which body parts we use for movement. Children will understand how the skeleton, muscles and joints work and that most animals have similar structures.	learn about the contribution of Mary Anning to the field of palaeontology. Children will understand how soil is formed and then investigate the permeability of different types of soil. They will link this with their DT unit of making a volcano.	investigate what plants need to grow well, and will present their findings. They will have a chance to predict what will happen in an investigation into the transportation of water within plants.	investigate reflective materials. Children will learn that the sun's light can be dangerous, and will create an advert for a pair of sunglasses or a sun hat that they have designed. The children will test which objects are opaque and will find out how shadows change when the distance between the object and light source changes. VIPERS - Light

	Key questions linked to Catholic Social Teaching: Participation- When we think of properties of a material, we can consider the properties and attributes that we as people have to offer. What are yours? How can we take action? Solidarity- Why is it important to work together?	**Key questions linked to Catholic Social Teaching:** Human Dignity- How can we treat all animals including humans respectfully? Why is it important to protect endangered animals?	**Key questions linked to Catholic Social Teaching:** Stewardship- How did God make the world? Why did God make the world? How can we look after our Wonderful world?	**Key questions linked to Catholic Social Teaching:** The Common Good- Are plants important for everyone in the community? Promoting Peace- How do health plants create a peaceful space in our environment? How do parks and gardens promote peace for the community? Why should we look after parks?	**Key questions linked to Catholic Social Teaching:** Human Dignity: Why is it important to respect all living things when we learn about light and nature?
	<u>Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills)</u> ★ Can they use different ideas and suggest how to find something out? ★ Can they take accurate measurements using different equipment and units of measure ★ Can they record their observations in different ways? - labelled diagrams, charts etc. ★ Can they describe what they have found using scientific language? ★ Can they explain what they have found out and use their measurements to say whether it helps to answer their question? ★ Can they ask relevant questions and use different types of scientific enquiries to answer them? ★ Can they set up simple practical enquiries, comparative and fair tests? ★ Can they use their results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions? ★ Can they identify differences, similarities or changes related to simple scientific ideas and processes?				

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	**Must be Au 1** **Sound** Children will learn about how sounds travel in vibrations, as well as how sounds can change pitch and loudness. The children will learn about how sounds are made, carrying out demonstrations of vibrations. The children will explore pitch, and will use their understanding of how high and low sounds are. The children will work to investigate the best material for soundproofing, in the context of making a music studio quieter.	**Animals including Humans** Children will learn about the digestive system in humans and animals and the functions of teeth. Children will learn more about herbivores, carnivores and omnivores in the context of teeth, digestion and the food chain. In addition, they will extend their understanding of food chains to more complex chains and food webs. VIPERS - Eating and Digestion VIPERS - The Human Body	**Must be Sp 1** **States of Matter 1** Children will learn about the differences between solids, liquids and gases, classifying objects and identifying their properties. **States of Matter 2** Children will have the chance to find the ideal temperature to melt chocolate. They will explore in-depth how water changes state, exploring melting, freezing, condensing as well as a particular focus on evaporation. Children will learn about the stages of the water cycle, creating mini water worlds.		**Must be Su 1** **Electricity** Children will learn about what electricity is and how it was discovered. They will identify which appliances use electricity in their homes and how to keep themselves safe. Children will construct circuits, start to create pictorial circuits and conduct an investigation into how easily different types of switches can break and reconnect a circuit.	**Living Things and their Habitats** Children explore a variety of ways to identify, sort, group and classify living things. They learn how animals are split into 'vertebrates' and 'invertebrates' and begin to consider the differences between these. They use and create classification keys to group, identify and name living things from the local habitat and beyond. This unit also introduces children to the idea that environments are subject to human-made and natural changes, and that these can have an impact on living things.

	Key questions linked to Catholic Social Teaching: **Human Dignity-** Why is it important to respect all living creatures? **Subsidiarity** How can we communicate to ensure everyone's voice is hear and respected?	**Key questions linked to Catholic Social Teaching:** **Stewardship-** How did God create a human so intricately that it allows us to survive? Did God design my teeth like they are now, or have they changed through generations?	**Key questions linked to Catholic Social Teaching:** **Distributive of Justice:** How can we support God's world with preserving the resources we have like water?	**Key questions linked to Catholic Social Teaching:** The Common Good- How can renewable energy sources promote the common good including future generations to come? Participation- How could we support our learning about electricity to protect our world?	**Key questions linked to Catholic Social Teaching:** Subsidiarity- Can you think and share some ideas to help our community and environment? Solidarity- How can we show do we care for our environment including all the living things in it?
	<u>Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills)</u> ★ Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated? Can they suggest improvements and predictions to their test? ★ Can they take measurements using different equipment and units of measure and record what they have found in a range of ways e.g., diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs. ★ Can they find any patterns in their evidence and can they evaluate and communicate their methods and findings? ★ Can they ask further questions based on their data and observations? ★ Can they identify differences, similarities or changes related to simple scientific ideas or processes?				

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	**Forces** Children learn about types of forces such as gravity, friction, water resistance and air resistance. Children will also learn about the use of mechanisms such as levers, gears and pulleys. The children will identify forces and find out about Isaac Newton and his discoveries about gravity. The children will look for patterns and links between the mass and weight of objects, using newton meters to measure the force of gravity. They will also work collaboratively to investigate air and water resistance. They will have the opportunity to explore friction. Children will discuss how variables other than the one being tested can be kept the same to help make a test fair. Children will find out about different	**Must be Au 2** **Earth and Space** Children learn about the relative size of the Moon, Earth and Sun. Children learn about the Earth's orbit and the phases of the moon. And Children will be able to recite the names of the planets in order. Children will record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph identifying scientific evidence that has been used to support or refute ideas or arguments. VIPERS - The Solar System	**Living things and their Habitats** Children will learn about the process of reproduction and the life cycles of mammals, amphibians, insects and birds. They will learn about different types of mammals and their different life cycles, making life cycle wheels to present their learning. They will explore metamorphosis in insects and amphibians, comparing their life cycles. Children will explore the life cycles of birds. VIPERS - Living things VIPERS - Animals **Living Things and their Habitats : Plant Life Cycles** Children will learn about the process of reproduction and the life cycles of plants, The children will explore reproduction in different plants, including different methods of pollination and asexual reproduction. The children will have the opportunity to take cuttings from plants, creating		**Animals including Humans** Children will learn about the changes that human beings experience as they develop to old age. Children will learn about the life cycle of a human being. They will investigate the development of babies and compare the gestation periods. They will learn about the changes experienced during growth. VIPERS - Illness VIPERS - Reproduction and Change	**Properties and changes of materials** Children will learn about different materials, their uses and their properties, as well as dissolving, separating mixtures and irreversible changes. The children will sort and classify objects according to their properties. They will explore the properties of materials to find the most suitable material for different purposes. The children will work scientifically and collaboratively to investigate the best thermal insulator for a mug making predictions and forming conclusions. Furthermore, they will have a chance to find the best electrical conductor. They will work in a hands-on way to explore dissolving, identifying the different variables. They will find out about different

	mechanisms, including levers, gears and pulleys, and will design their own marvellous machine. VIPERS - Forces		clones of the parent plant.		ways to separate mixtures of materials, using filtering, sieving and evaporating. Finally, they will learn about irreversible changes.
	Key questions linked to Catholic Social Teaching: Stewardship- How do forces like wind and water change our environment? What can we do to help take care of our Earth?	**Key questions linked to Catholic Social Teaching:** Solidarity- How does the study of Earth and Space remind us of our responsibility to look after our planet? What must we all do to help look after our precious world? Solidarity- Earth and Space- How does the study of Earth and Space remind us of our responsibility to share resources?	**Key questions linked to Catholic Social Teaching:** Stewardship- How can helping the environment and looking after our planet support the healthy growth of plants and animals?	**Key questions linked to Catholic Social Teaching:** The Common Good- How does learning about the Human life cycle show the wonder and importance of enabling human growth, in order to flourish as part of his family?	**Key questions linked to Catholic Social Teaching:** Preferential Option of the Poor- How can knowledge about properties of materials empower us to reduce, reuse and recycle? Participation- Why is it important to work together when completing an investigation?
	<u>Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills)</u> ★ Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary and can they use test results to make predictions to set up comparative and fair tests. ★ Can they decide what measurements to take? ★ Can they use a range of scientific equipment with increasing accuracy and precision and take repeat readings when appropriate? ★ Can they record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar and line graphs? ★ Can they use a graph to answer scientific questions?				

	★ Can they present a report of their findings through writing, display and presentation?

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 6	**Living Things and Their Habitats** Children will learn to give reasons for the classification of animals and match groups of animals to their characteristics. They will design a creature that has a specific set of characteristics, using prompts. The children will learn about the useful and harmful effects of different microorganisms. They will then use this knowledge to identify the variables in an investigation into harmful microorganisms	**Must be Au 2** **Light** Children will learn about light, reflection and refraction. The children will learn how light travels and how this enables us to see. The children will have the opportunity to make a functioning periscope, finding out about mirrors and the angles of reflection and incidence. They will work to investigate refraction, carrying out some fascinating experiments into the effects of bending light. Children will have a chance to predict what will happen in an investigation into the visible spectrum. They will explore how light	**Evolution and Inheritance** Children will learn about variation and adaptation. They will be able to explore how both Charles Darwin and Alfred Wallace separately developed their theories of evolution. They will examine the scientific evidence from plants and animals that has been gathered to support the theory of evolution.	**Animals Including Humans** Children will build on their knowledge and understanding of different systems within the body. They will research the parts and functions of the circulatory system. They will focus on how nutrients are transported around the human body. Children will explore how a healthy lifestyle supports the body to function and how different types of drugs affect the body. There will be focus on key scientists in this unit. VIPERS - Heart and Circulation VIPERS - Healthy bodies		**Must be Su 2** **Electricity** . Children will learn to represent circuits using symbols in a diagram. They will learn about two of the most important scientific inventors in the field of electricity – Thomas Edison and Nikola Tesla. Children will get the opportunity to develop their understanding of what electricity is and how to measure it. As well as conducting their own investigation, they will get the opportunity to create their own torch.

	and draw conclusions. VIPERS - Classification	creates the colours we see, designing coded messages. Children will learn about Isaac Newton and his theory of light and colour. VIPERS - Isaac Newton			
	Key questions linked to Catholic Social Teaching: Human Dignity: How does protecting the habitats of plants and animals show respect for the dignity of all living things, including humans, who rely on the environment to survive? The Common Good- How can studying animals teach us to take an active role in promoting health, wellbeing and peace for everyone?	**Key questions linked to Catholic Social Teaching:** Participation- How can our understanding of light and energy help us participate in creating solutions like solar power to help communities?	**Key questions linked to Catholic Social Teaching:** Preferential Option of the Poor- How can our understanding of evolution help us to make sure that science helps people in need?	**Key questions linked to Catholic Social Teaching:** **The Common Good-** How can studying animals teach us to take an active role in promoting health, wellbeing and peace for everyone?	**Key questions linked to Catholic Social Teaching:** **Distributive of Justice:** How is electricity distributed? How can our understanding of electricity and energy consumption lead to a fairer distribution of resources?
	Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills ★ Can they explore different ways to test an idea, choose the best way, and give reasons?				

	★ Can they identify the key factors when planning a fair test and can they vary one factor whilst keeping the others the same in an experiment, can they explain why they do this? ★ Can they explain why they have chosen specific equipment? Can they make precise measurements and can they decide which units of measurement they need to use? Can they explain why a measurement needs to be repeated? ★ Can they find a pattern from their data and explain what it shows and can they link what they have found out to other science? ★ Can they suggest how to improve their work and say why they think this?