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.

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.
	<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	**Everyday Materials** Children learn about everyday materials including wood, plastic, metal, water and rock. Children will learn to identify and name everyday materials and will have the opportunity to explore the properties of	**Seasonal changes (Autumn/Winter)** Children learn about the four seasons, with a particular focus on autumn and winter. Children will learn how different types of weather can be measured. Children will use a class weather station to	**Animals Including Humans - Animals** 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 itsaccording to	**Plants** Children learn about about the structure of plants and trees and what they need to grow well. Children engage in a variety of activities including identifying common plants and trees in the garden and in the wild, sorting	**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	**Seasonal Changes (Spring /Summer)** This Children learn about spring and summer. Children will continue to use a class weather station to observe, measure and record the weather in different seasons and will start to make

	these materials. Children will carry out a simple investigation to help them decide which material would be most suitable to use for an umbrella. Children apply their knowledge of everyday materials to sort objects by their properties. A range of learning activities are used in this unit including, discussions, labelling and an investigation where children have the opportunity to ask and find the answers to questions.	observe measure and record the weather across the seasons. They will also observe changes across the seasons by exploring the signs of autumn and winter through nature and wildlife.	their group. They will also learn about the different diets animals eat. features and will classify animals	deciduous and evergreen leaves. Children will plant their own bean and observe it closely over the coming weeks by measuring and recording its growth.	classify animals according to their own criteria.	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 summer through nature and wildlife. A range of learning activities are used in this unit, including observation, discussion and learning outside.

	<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 be healthy. Children classify different kinds of animal babies, learn about the basic needs that are shared by humans and	**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	**Animals including Humans - Diet and health** Focusing their own experiences, children explore the need for humans to eat a varied diet, to keep themselves clean, and to take regular exercise.	**Living things and their habitats** Children learn about a variety of habitats and the plants and animals that live there. They learn to tell the difference between things that are living, dead and things that have never been alive, and apply this in a range of contexts. They make observations of a	**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	**The Environment** Children learn about the ecological challenges that face the modern world. Children undertake a range of activities that challenge them to engage with environmental issues and to understand the simple changes we can make to live more sustainable lives.

	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. Children learn about new discoveries which have been made over time with a specific focus on John McAdam. 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.		local habitat and the creatures that live there, investigating conditions in local microhabitats and how they affect the minibeasts found within them. This unit allows children to research a range of global habitats and how the living things that live there are suited to their environments, and also provides an introduction to the idea of dependency between plant and animal species.	throughout the unit 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.	

	<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	**Forces and magnets** Children will learn about forces, friction and magnetic attraction. They will learn about forces in the context of pushing and pulling, and will identify different actions as pushes or pulls. The children will work scientifically and	**Animals Including Humans: Nutrition** Children will learn about the importance of exercise, about the need to eat the right amount of different types of food. They will learn that animals cannot make their own food. They will learn that some animals only eat	**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 scientifically and collaboratively to investigate reflective materials, in the context of designing a new	**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 learn about the contribution of	**Plants** Children will learn the names of different parts of plants, and the jobs they do. The children will work scientifically and collaboratively to investigate what plants need to grow well, and will present their findings to their classmates. Furthermore, they will have	**Animals Including Humans: Skeleton, muscles and Movement** Children will learn which body parts we use for everyday movement. Children will understand how the skeleton, muscles and joints work and that most animals have

	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. The children will have chance to explore the way magnetic poles can attract and repel in an exciting activity, making their own compass and using it to find hidden items. The children will use their understanding of magnetic attraction to design and create their own magnetic game. They will	animals, some only eat plants and some eat both. Finally children will learn how nutrients and water are transported around animals.	book bag. 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 have chance to test which objects are opaque in an exciting investigation to design the most effective curtains, and will find out how shadows change when the distance between the object and light source changes. They will develop their scientific enquiry skills, making observations, predictions and conclusions.	Mary Anning to the field of palaeontology. Children will understand how soil is formed and then investigate the permeability of different types of soil.	chance to predict what will happen in an exciting investigation into the transportation of water within plants. Children will identify the parts of a flower, and will explore the different stages of the life cycle of a flowering plant.	similar structures. Children will learn that animals, including humans, grow into adults.

	develop their scientific enquiry skills, making observations, predictions and conclusions					
	<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?					

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	**Sound** Children will learn about how vibrations cause sounds and how sounds travel, as well as how	**Animals including Humans** Children will learn about the digestive system in humans and	**States of Matter 1** Children will learn about the differences between solids, liquids and	**States of Matter 2** Children will have the chance to find the ideal temperature to melt chocolate.	**Electricity** Children will learn about what electricity is and how it was discovered. They will identify	**Living Things and their Habitats** Children explore a variety of ways to identify, sort, group and

	sounds can change pitch and loudness. The children will learn about how sounds are made, carrying out demonstrations of vibrations, and completing a sound survey of their school. They will work in groups to create a human model of the way particles pass sound vibrations on, and write and star in their own documentary explaining how sound travels. The children will explore pitch, and will use their understanding of how high and low sounds are made to create their own set of pan pipes. They will have the	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.	gases, classifying objects and identifying their properties. The children will work scientifically and collaboratively to investigate the weight of a gas.	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 and an interactive water wheel to represent the different stages	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.	classify living things. They learn how animals are split into 'vertebrates' and 'invertebrates' and begin to consider the differences between living things within these classifications. 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 changes can have a significant

	opportunity to make a string telephone, and will use this to investigate how sounds change over distance and through different materials. The children will work scientifically and collaboratively to investigate the best material for soundproofing, in the context of making a music studio quieter. Finally, they will demonstrate their learning from the whole unit by designing and creating their own musical instrument that will play high, low, loud and quiet sounds.					impact on living things. Throughout the unit children work scientifically by gathering, recording and presenting information in different ways.

	Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills) ★ 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?

Implementation - curriculum coverage

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Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	**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. Children will find out about Jane Goodall and her work with the now-endangered chimpanzees in Africa. They will explore metamorphosis in insects and amphibians, comparing their	**Earth and Space** Children learn about the relative size of the Moon, Earth and Sun. They learn how and why shadows change. 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	**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	**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 clones of the parent plant.	**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 period of humans and other animals. They will learn about the changes experienced during puberty and why these occur. Children will investigate the changes to the body as humans get	**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

	life cycles. Children will explore the life cycles of birds.	evidence that has been used to support or refute ideas or arguments.	work collaboratively to investigate air and water resistance. They will have the opportunity to explore friction, developing their own brake pad for a tricycle or scooter. 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 mechanisms, including levers, gears and pulleys, and will design their own marvellous machine.		older, as well as comparing the life expectancy of different animals.	best thermal insulator to make a lunch box, making predictions and forming conclusions. Furthermore, they will have chance to find the best electrical conductor, in the context of making floodlights brighter. They will have the opportunity to work in a hands-on way to explore dissolving, identifying the different variables in their own investigations. They will find out about different ways to separate mixtures of materials, using filtering, sieving

						and evaporating. Finally, they will learn about irreversible changes, and participate in two exciting investigations to create new materials, including casein plastic and carbon dioxide.
	<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 take measurements using 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**	**Light** Children will learn about light,	**Evolution and Inheritance** Children will	**Animals Including Humans**	**The Science of Sport'** Children will	**Electricity** . Children will learn to

		how we see, shadows, reflection and refraction. The children will learn how light travels and how this enables us to see objects. he children will have the opportunity to make a functioning periscope, finding out about mirrors and the angles of reflection and incidence. They will work scientifically and collaboratively 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	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.	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.	investigate and explore the grounds, the kit, the people, the physics, night time matches... and even reflect on their own sporting prowess in this revision block that can be taught across a half term, or in the form of a science week.	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.

		investigation into the visible spectrum. They will work in a hands-on way to explore how light creates the colours we see, designing coded messages. Children will learn about Isaac Newton and his theory of light and colour,				
	<u>Key objectives (Pupils must know and remember theses facts / Improve, hone & apply these skills)</u> ★ 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?					