

Science

Intent

At St Thomas we believe that Science is a body of knowledge and ideas built up from exploring concepts and asking questions, in order to develop a greater understanding of the world in which we live. We believe it as a means of nurturing children's love of asking questions and finding ways to answer them through fun and practical activities. The intent of this subject is supported and informed by current National guidance on best practise, in-service training, staff discussion and professional judgement

Aims for Science:

To provide a Science curriculum where children develop a way of thinking and working scientifically, asking questions, observing closely, performing simple tests using simple equipment and then using these observations and ideas to suggest questions to answer and gather information to answer them.

To develop scientific knowledge where they understand the nature, processes and methods of Science in the world around them, and also to understand the uses and implications of science, today and in the future.

Implementation

What does Science look like at St Thomas?

All Science lessons are taught by class teachers. Every class has approximately two hours of Science teaching and learning per week. To ensure all scientific skills are covered, teachers followed a detailed curriculum pathway, developed from the National Curriculum.

Where possible, Science objectives are linked to, and taught alongside other Curriculum areas, developing a holistic view of how science affects the world we live in and topical issues of the time.

Impact

In Science there are 2 levels to this.

Children have the opportunity to express themselves and develop their self-confidence through a non-academic subject. They have the opportunity to explore, create and collaborate to produce their own music.

Children are assessed every lesson which helps the teacher plan the next steps in their learning. At the end of each term, assessment data is gathered and progress is checked by the subject leader. Children are expected to make good or better progress in all subjects and this individual progress is tracked and reported to parents and carers at parents evening and on the end of year report.

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. • Can talk about some of the things they have observed such as plants, animals, natural and found objects. • Talks about why things happen and how things work. • Developing an understanding of growth,	Looks closely at similarities, differences, patterns and change. Early Learning Goal Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from	• Ask simple questions and recognise that they can be answered in different ways • observe closely, using simple equipment e.g. hand lenses, egg timers • perform simple tests • identify and classify • use their observations and ideas to suggest answers to questions gather and record data to help in answering questions		• Asking relevant questions and using different types of scientific enquiries to answer them. • setting up simple practical enquiries, comparative and fair tests • make systematic and careful observations and where appropriate , taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • 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		• 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. • use test results to make predictions to set up further comparative and fair tests. • reporting and presenting findings from enquiries , including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. • Identify scientific evidence that has been used to	

	decay and changes over time. • Shows care and concern for living things and the environment.	one another. They make observations of animals and plants and explain why some things occur, and talk about changes.		presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identify differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings	support or refute ideas or arguments.
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	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living things and their habitats	PLANTS •Identify and name a variety of common plants including garden plants and wild plants and those classified as deciduous and evergreen trees •Identify and describe the basic structure of a variety of common flowering plants including trees including leaves, flowers(blossom), petals, fruit, bulb, seed, trunk, branches, stem	PLANTS •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. (germination and reproduction) Living things and their habitats •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	PLANTS •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 •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	Living things and their habitats •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.	Living things and their habitats •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

		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 •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.				
Seasonal Changes	•observe changes across the four seasons •observe and describe weather associated with the seasons and how day length varies.					
Animals, including humans	•identify and name a variety of common animals that are fish, amphibians, reptiles,	•notice that animals, including humans, have offspring which grow into adults	•identify that animals, including humans, need the right types and amount of nutrition, and that they	•describe the simple functions of the basic parts of the digestive system in humans	•describe the changes as humans develop to old age.	•identify and name the main parts of the human circulatory system, and describe the functions of the

	birds, mammals and invertebrates •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 that are fish, amphibians, reptiles, birds, mammals and invertebrates •identify , name ,draw and label the basic parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth)and say which part of the body is associated with each sense.	•find out about and describe the basic needs of animals, including 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.	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, protection and movement.	•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.		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.
States of matter				•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.		
Materials	Everyday materials •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	Uses of everyday materials •identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	Rock 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		Properties and changes of materials •compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical	

	•describe the simple physical properties of a variety of everyday materials (e.g. hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/ not waterproof, absorbent/not absorbent, opaque/transparent) •compare and group together a variety of everyday materials on the basis of their simple physical properties •find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	•find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	that have lived are trapped within rock •recognise that soils are made from rocks and organic matter		and thermal), and response to magnets •know that some materials will dissolve in liquid to form a solution, and describe how to 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	
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					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.	
Earth and space					•describe the movement of the Earth, and other planets, relative to the Sun in the solar system •describe the movement of the Moon relative to the Earth •describe the Sun, Earth and Moon as approximately spherical bodies •use the idea of the Earth's rotation to	

					explain day and night and the apparent movement of the sun across the sky	
Forces			Forces and magnets •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 •compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials •describe magnets as having two poles		•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	

			•predict whether two magnets will attract or repel each other, depending on which poles are facing.			
Evolution and inheritance						•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.

Physical Processes			Light •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.	Sound •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. Electricity •identify common appliances that run on electricity		Light •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. Electricity •associate the brightness of a lamp or the volume of a buzzer with the number and
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				•construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers •identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery •recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit •recognise some common conductors and insulators, and associate metals with being good conductors.		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.
People		Pupils might find out about people who have developed useful			•David Attenborough and Jane Goodall	•the work of scientists such as Carl Linnaeus, a

		new materials, for example John Dunlop, Charles Macintosh or John McAdam			•They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. •the work of scientists such as Ptolemy, Alhazen and Copernicus. •Galileo Galilei and Isaac Newton	pioneer of classification. •work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.
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