ST WERBURGH'S CATHOLIC PRIMARY SCHOOL

Science Curriculum

Intent

At St Werburgh's Catholic Primary School, we have designed a Science curriculum that strives to provide the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. We are committed to achieving this through a high-quality curriculum, rich in experiences where pupils encounter a wide range of topics, enriched by educational visits both in and outside of school. We provide opportunities for school trips to ensure our pupils develop the scientific skills and knowledge needed to observe, identify, gather and record data.

Informed by the National Curriculum, our high quality planning aims to equip all pupils with knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils will be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave and analyse causes. We aim to equip our pupils with the vocabulary to enable them to communicate and articulate their knowledge, ideas and enquiries within their science lessons.

Implementation

Science at St Werburgh's Catholic Primary School is taught through a topic based approach in either half termly or termly blocks throughout the year, focusing on the knowledge and skills stated in the National Curriculum.

The long term plan has been developed using the Kent scheme of work, this ensures exposure to a breadth of topics as well as coverage of the National Curriculum objectives across the school. In medium term planning, teachers have created a sequence of lessons which provide pupils with scientific knowledge and concepts that carefully plan for progression and depth. The scientific skills taught are suited to each age group to ensure we implement a curriculum that is progressive throughout the whole school. Teachers identify clear end points for each topic and their sequence of lessons lead clearly to those endpoints. Teachers build on pupil's prior learning and ensure that consideration is given to the school context and opportunities for building cultural capital. Key vocabulary is promoted during lessons and through displays to promote a language rich Science curriculum essential to the successful acquisition of knowledge and understanding in Science.

Teachers use their judgement to implement a variety of teaching approaches to deliver science lessons and follow their pupils' interests to ensure their learning is engaging, broad and balanced. Pupils have access to a range of secondary resources such as digital technology and fiction and

non-fiction books to develop their knowledge and understanding that is integral to their learning. In order to carry out investigations and to work scientifically pupils are provided with scientific equipment.

Pupils will learn about the lives of significant individuals in the past who have contributed to national and international scientific achievements, linked to their topics. The pupils will be introduced to a diverse range of scientists including women and scientists from different ethnic backgrounds.

Impact

Our Science curriculum will ensure all of our pupils, regardless of different backgrounds and starting points, have the same opportunities to explore and enquire about the world in which they live. Knowledge, understanding and skills will be secured and embedded so that all pupils achieve their full potential.

Pupils will develop a curiosity of the natural world around them that will stay with them, and will have the scientific language to continue to articulate their questions as they continue their education.

When pupils encounter a challenge, they will demonstrate resilience. They will develop a sense of responsibility to look after the world, its resources and people around us. We aim to ensure that all pupils are equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future. Science has changed our lives and is vital to the world's future prosperity.

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Long Term Science Curriculum Map

Pre-School	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	The natural world • Through outdoor and indoor provision activities children will repeat actions that have an effect. • Explore materials with different properties. • Explore natural materials, indoors and outside. Autmnal walks (collecting leaves,, conkers etc) • Explore and respond to different natural phenomena in their setting and on trips (trips around the local community).	**The natural world** • Through outdoor and indoor provision activities children will repeat actions that have an effect. • Explore materials with different properties. • Explore natural materials, indoors and outside. Loose parts within the classroom. • Explore and respond to different natural phenomena in their setting and on trips (trips around the local community).	**The natural world** • Through outdoor and indoor provision activities children will repeat actions that have an effect. • Explore materials with different properties. Exploring ice indoors and outdoors. • Explore natural materials, indoors and outside. • Explore and respond to different natural phenomena in their setting and on trips (trips around the local community).	**The natural world** • Through outdoor and indoor provision activities children will repeat actions that have an effect. • Explore materials with different properties. • Explore natural materials, indoors and outside. Looking at plants and growth. • Explore and respond to different natural phenomena in their setting and on trips (trips around the local community).	**The natural world** • Through outdoor and indoor provision activities children will repeat actions that have an effect. • Explore materials with different properties. • Explore natural materials, indoors and outside using the mud kitchen. • Explore and respond to different natural phenomena in their setting and on trips (trips around the local community).	**The natural world** • Through outdoor and indoor provision activities children will repeat actions that have an effect. • Explore materials with different properties. • Explore natural materials, indoors and outside. • Explore and respond to different natural phenomena in their setting and on trips (trips around the local community).
F1	**Aut 1**	**Aut 2**	**Spr 1**	**Spr 2**	**Sum 1**	**Sum 2**
	The Natural World Children will know the names of body parts: heads, arms, hands, legs, feet, neck.	**The Natural World** Children will investigate light, dark and shadows. Children will make collections of natural materials to investigate and talk about.	**The Natural World** Children will know how materials change when melting. Children will know how materials change when cooking, cooling and heating.	**The Natural World** Children will know that a butterfly comes from an egg. Children will know how to respect and care for living things. .	**The Natural World** Children will find out about different animals that live under the sea.	**The Natural World** Children will explore and talk about forces including magnets, floating/sinking and stretching.

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F2	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	The Natural World Children will know the names of body parts: shoulders, knees, ankles. Children will know the 5 senses. Children will know that this time of year is Autumn	**The Natural World** Children will identify plastic and metal. Children will explore floating and sinking. Children will know that there are 8 planets in the solar system.	**The Natural World** Children will know that this time of year is Winter. Children will know about Penguins and where they live. Children will know what material a magnet picks up.	**The Natural World** Children will observe changes and growth of beans and other plants. Children will know the life cycle of a sunflower. Children will know how to care for a plant. Children will know that this time of year is Spring.	**The Natural World** Children will know that some animals don't live in England in the wild and originate in other climates. Children will know that some animals lay eggs and others have live young.	**The Natural World** Children will know the names of the 4 seasons and weather associated with them. Children will observe how a tree has changed over the 4 seasons.Children will know that this time of year is Summer.

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 1	**Animals including humans**		**Everyday materials**		**Plants**	
Key knowledge	*Identify and name a variety of common animals, including fish, amphibians, reptiles, birds and mammals. *Identify and name a variety of common animals that are carnivores, herbivores and omnivores. *Describe and compare the structure of a variety of common animals. *Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.		*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.		*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.	
	Seasonal changes					
Key knowledge	*Observe changes across the four seasons. *Observe and describe weather associated with the seasons and how day length varies.					

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 2	**Uses of everyday materials**	**Animal, including humans**		**Plants**	**Living things and their habitats** (butterfly garden)	
Key knowledge	*Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	*Notice that animals, including humans, have offspring which grow into adults. *Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).		*Observe and describe how seeds and bulbs grow into mature plants. *Find out and describe how plants need water,	*Explore and compare the differences between things that are living, dead, and things that have never been alive. *Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. *Identify and name a variety of plants and animals in their habitats, including microhabitats.	

	*Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	*Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	light and a suitable temperature to grow and stay healthy.	*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.

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 3	**Animals including Humans**	**Rocks**	**Forces and Magnets**	**Light**	**Plants**	
Key knowledge	*Identify that animals, including humans need the right types and amount of nutrition and that they cannot make their own food; they get nutrition from what they eat. *Identify that humans and some animals have skeletons and muscles for support, protection and movement.	* 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.	*Compare how things move on different surfaces. *Notice that some forces need contact between two objects, but magnetic forces can act at a distance.	*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 an opaque object. find patterns in the way that the size of shadows change.	*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	

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 4	**Sound**	**States of Matter**	**Animals including Humans**	**Electricity**	**Living things and their Habitats**	
Key knowledge	*Identify how sounds are made, associating some of them with something vibrating. *Recognise that vibrations from sounds travel through a medium to the ear.	*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	* Describe the simple functions of the basic parts of the digestive system in humans. * Identify the different types of teeth in humans and	*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	*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.	

	*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 increase	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.	their simple functions. * Construct and interpret a variety of food chains, identifying producers, predators and prey.	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.	*Recognise that environments can change and that this can sometimes pose dangers to living things.

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 5	**Forces**	**Properties and changes of materials**	**Living things and their habitats**	**Animals, including humans**	**Earth and space**	
Key knowledge	*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.	*Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets *Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. *Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. *Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. *Demonstrate that dissolving, mixing and changes of state are reversible changes.	*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.	*Describe the changes as humans develop to old age.	*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.	

		*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.			

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 6	**Animals, including humans**	**Electricity**	**Light**	**Living things and their habitats**	**Evolution and inheritance**	
Key knowledge	*Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. *Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. *Describe the ways in which nutrients and water are transported within animals, including humans.	*Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. *Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. *Use recognised symbols when representing a simple circuit in a diagram.	*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.	*Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. *Give reasons for classifying plants and animals based on specific characteristics.	*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	