



'Be the light...'

let your light shine before others, so that they may see your good works and give glory to your Father in heaven.
(Matt. 5:14-16)

We are a church school where education is nourished through the teachings of Jesus Christ, enabling each child to fulfil their potential and which reflects our commitment to academic excellence.

Science

Intent:

At Norley we encourage children to be inquisitive throughout their time at school and beyond. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group.

Key skills are also mapped for each year group and are progressive throughout the school. These too ensure systematic progression to identified skills end points which are in accordance with the Working Scientifically skills expectations of the national curriculum. The curriculum is designed to ensure that children are able to acquire key scientific knowledge through practical experiences; using equipment, conducting experiments and explaining concepts confidently. Children are encouraged to ask questions and be curious about their surroundings and a love of science is nurtured through a whole school ethos and a varied science curriculum.

Implementation:

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

- Through our planning, we involve problem solving opportunities that allow children to apply their knowledge, and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up. Tasks are selected and designed to provide appropriate challenge to all learners, in line with the school's commitment to inclusion.
- We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases they become more proficient in selecting and using scientific equipment, collating and interpreting results and their ability to draw conclusions based on real evidence.
- Working Scientifically skills are embedded into lessons to ensure that skills are systematically developed throughout school and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Teachers demonstrate how to use scientific equipment effectively and safely and the various Working Scientifically skills in order to embed scientific understanding.
- Regular events, such as Science Week allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. These events often involve families and the wider community.
- At the end of each topic, key knowledge is reviewed by the children and rigorously checked by the teacher and consolidated as necessary.

Impact:

The successful approach we have to Science results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them.

Children at Norley enjoy science and this results in motivated learners with sound scientific understanding.

Long Term Planning

Cycle A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Class 1-Reception	<i>In Class 1 Science is taught through the Understanding of the World unit.</i>					
	<i>Members of our family and the community</i> • Talk about members of their immediate family and community. • Name and describe people who are familiar to them. • Comment on images of familiar situations in the past. • Understand that some places are special to members of their community.	<i>Celebrations</i> • Recognise that people have different beliefs and celebrate special times in different ways. • Recognise some similarities and differences between life in this country and life in other countries. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live. • Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class.	<i>Seasonal Change</i> • Understand the effect of changing seasons on the natural world around them. • Explore the natural world around them, making observations and drawing pictures of animals and plants. • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.			
Class 2 Yr 1/2	<u>Everyday materials</u> Can I distinguish between an object and the material from which it is made? Can I identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock? Can I describe the simple physical properties of a variety of everyday materials?		<u>Seasonal changes</u> Can I observe changes across the four seasons? Can I observe and describe weather associated with the seasons and how day length varies?		<u>Plants</u> Can I identify and name a variety of common wild and garden plants, including deciduous and evergreen trees? Can I identify and describe the basic structure of a variety of common flowering plants, including trees? Can I observe and describe how seeds and bulbs grow into mature plants?	

	Can I compare and group together a variety of everyday materials on the basis of their simple physical properties?			Can I find out and describe how plants need water, light and a suitable temperature to grow and stay healthy?
Class 3 Yr 3/4	<u>Light</u> Can I recognise that we need light in order to see things and that dark is the absence of light? Can I notice that light is reflected from surfaces? Can I recognise that light from the sun can be dangerous and that there are ways to protect our eyes? Can I recognise that shadows are formed when the light from a light source is blocked by a solid object? Can I find patterns in the way that the size of shadows change?	<u>Rocks</u> Can I compare and group together different kind of rocks on the basis of their appearance and simple physical properties? Can I describe in simple terms how fossils are formed when things that have lived are trapped within rock? Can I recognise that soils are made from rocks and organic matter?	<u>Habitats and living things</u> Can I recognise that living things can be grouped in a variety of ways? Can I explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment? Can I recognise that environments can change and that this can sometimes pose dangers to living things?	<u>Plants</u> Can I identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers? Can I 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? Can I investigate the way in which water is transported within plants? Can I explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal?
Class 4 Yr 5/6	<u>Forces</u> Can I explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object? Can I identify the effects of air resistance, water resistance and friction,	<u>Electricity</u> Can I associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit? Can I compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and	<u>Properties and changes of materials</u> Can I 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? Do I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution? Can I use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating?	<u>Living things and their habitats</u> Can I describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird? Can I describe the life process of reproduction in some plants and animals? Can I describe the changes as humans develop to old age? Can I describe how living things are classified into broad groups according to common observable characteristics and based on similarities and

	that act between moving surfaces? Can I recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect?	the on/off position of switches? Can I use recognised symbols when representing a simple circuit in a diagram?	Can I give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic? Can I demonstrate that dissolving, mixing and changes of state are reversible changes? Can I 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?		differences, including micro-organisms, plants and animals? Can I give reasons for classifying plants and animals based on specific characteristics?	
Cycle B	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Class 1-Reception	In Class 1 Science is taught through the Understanding of the World unit.					
	Members of our family and the community • Talk about members of their immediate family and community. • Name and describe people who are familiar to them. • Comment on images of familiar situations in the past. • Understand that some places are special to members of their community.		Celebrations • Recognise that people have different beliefs and celebrate special times in different ways. • Recognise some similarities and differences between life in this country and life in other countries. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live. • Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class.		Seasonal Change • Understand the effect of changing seasons on the natural world around them. • Explore the natural world around them, making observations and drawing pictures of animals and plants. • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	
Class 2 Yr 1/2	Uses of everyday materials - Can I Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses? - Can I find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching?		Living things and their habitats - Can I explore and compare the differences between things that are living, dead, and things that have never been alive? - Can I 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?		Animals, including humans - Can I notice that animals, including humans, have offspring which grow into adults? - Can I find out about and describe the basic needs of animals, including humans, for survival (water, food and air)? - Can I describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene?	

			Can I identify and name a variety of plants and animals in their habitats, including microhabitats? Can I 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?		Can I identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals? Can I identify and name a variety of common animals that are carnivores, herbivores and omnivores? Can I compare the structure of a variety of a variety of common animals (fish, amphibians, reptiles, birds, mammals, including pets)? Can I identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense?
Class 3 Yr 3/4	<u>States of Matter</u> Can I compare and group materials together, according to whether they are solids, liquids or gases? Can I 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? Can I identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature?	<u>Forces and magnets</u> Can I compare how things move on different surfaces? Can I notice that some forces need contact between two objects, but magnetic forces can act at a distance? Can I observe how magnets attract or repel each other and attract some materials and not others? Can I 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? Can I describe magnets as having two poles? Can I predict whether two magnets will attract	<u>Sound</u> Can I identify how sounds are made, associating some of them with something vibrating? Can I recognise that vibrations from sounds travel through a medium to the ear? Can I notice that there are patterns between the pitch of a sound and features of the object that produced it? Can I find patterns between the volume of a sound and the strength of the vibrations that produced? Can I understand why sounds get fainter as the distance from the sound source increases?	<u>Electricity</u> Can I identify which common appliances run on electricity? Can I construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers? Can I 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? Can I recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit? Can I recognise some common conductors and insulators, and associate	<u>Animals, including humans</u> Can I understand why humans and some other animals have skeletons and muscles for support, protection and movement? Can I understand why animals, including humans, need the right types and amount of nutrition? Can I understand why animals including humans make their own food and get nutrition from what they eat? Can I describe how the basic parts of the digestive system in humans work? Can I identify the different types of teeth in humans and their simple functions? Can I construct and interpret a variety of food chains, identifying producers, predators and prey?

		or repel each other, depending on which poles are facing?		metals with being good conductors?	
Class 4 Yr 5/6	<u>Light</u> Can I recognise that light appears to travel in straight lines? Can I 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? Can I 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? Can I use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them?		<u>Evolution and inheritance</u> Can I recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago? Can I recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents? Can I identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution?		<u>Earth and space</u> Can I describe the movement of the Earth, and other planets, relative to the Sun in the solar system? Can I describe the movement of the Moon relative to the Earth? Can I describe the Sun, Earth and Moon as approximately spherical bodies? Can I use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky?
					<u>Animals including humans</u> Can I identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood? Can I recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function? Can I describe the ways in which nutrients and water are transported within animals, including humans?