



CALVERLEY PARKSIDE



Science Curriculum Overview

Curriculum Intent

Our Vision for Science

Curriculum Intent

The Science curriculum will enable children to learn and practice the key skills and knowledge as set out in the National Curriculum. Through Science at Calverley Parkside Primary School, pupils will:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

In addition to the National Curriculum aims, our school vision sets out the following aims which will be achieved through the teaching of high-quality Science sequences of learning:

- Pupils who are able to demonstrate independence and effective team-working skills, understanding the importance of taking ownership of their own learning

journey.

- Pupils who have access to an engaging, ambitious and inclusive Science curriculum.
- Pupils who are prepared for modern-life – equipped with the scientific knowledge of Science today, and for the future.
- Pupils who are happy in their learning.
- Pupils who are challenged in a supportive environment.
- Instilling a lifelong love of learning in Science.

The Science Curriculum reflects our school values in the following ways:

Ready: *We keep going when things get difficult*- it is vital that pupils develop a secure scientific understanding of each key block of knowledge and concepts in order to progress, therefore pupils will be taught and supported throughout their Science journey at Calverley Parkside, to enable students to overcome obstacles and barriers they may face in lessons and at each transitional Key Stage.

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We prepare for the future by setting high expectations of ourselves –We want to ensure that all our students are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future. Teachers’ beliefs about their students and what they can achieve have a substantial impact on students’ learning and progress. Therefore, our school focuses on setting high expectations in Science such as; creating a warm and supportive classroom climate, giving students the responsibility for their own learning and investigations, communicating effectively the Learning Challenge each lesson, having pupils set their own goals and targets, setting activities for a variety of levels of attainment and encouraging reflective thinking after completing Science investigations.

We are ready to learn and are positive about new challenges – In our Science lessons we foster a ‘can do’ attitude in our students, we deliver content with curiosity, we encourage children to ask questions and enable them to develop a deeper understanding of scientific ideas through the use of a wide range of first-hand practical experiences, where appropriate.

Respectful: *We look after our environment and equipment* – Children will be taught how to use a wide range of equipment safely and effectively.

We always listen when others are talking – We endeavour to persistently and relentlessly catch learners demonstrating the desired behaviours and give reminders about our expectations when listening to others.

Responsible: *We follow instructions first time, every time* - The importance of listening carefully to instructions will be constantly revisited, particularly in instances where

specialist equipment is being used.

Substantive Knowledge		
Biology	Chemistry	Physics
Biology is the study of living things and the evolution of life. Living things include humans, plants, animals and microorganisms. The children will learn about how living things are categorised, the life cycles of living things and how they co-exist together in habitats	Chemistry is the study of materials that make up our bodies and everything in the world around us. The children will learn about the different types of materials different objects are made from and their different properties. Children will also learn about the similarities and differences of solids, liquids and gases.	The aim of physics is to explain how things move in space and time and understand how the universe behaves. It studies matter, forces and their effects.

Science Skills Progression

Working Scientifically	Reception	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
Plan		Ask simple questions when prompted. Suggest ways of answering a question.	Ask simple questions. Recognise that questions can be answered in different ways.	Ask relevant questions when prompted. Use different types of scientific enquiry to answer them. Set up simple and practical enquiries, comparative and fair tests with some support.	Ask relevant questions. Use different types of scientific enquiries to answer their questions. Set up simple and practical enquiries, comparative and fair tests.	Plan different types of scientific enquiries to answer questions. With prompting, recognise and control variables where necessary.	Plan different types of scientific enquiries to answer questions.. Recognise and control variables where necessary.
Do		Make relevant observations using simple equipment. Conduct simple tests, with support. Identify and classify with guidance.	Observe closely, using simple equipment. Perform simple tests Identify and classify.	Make systematic and careful observations, using simple equipment. Use standard units when taking measurements.	Make systematic and careful observations using a range of equipment, including thermometers and data loggers. Take accurate measurements using standard units, where appropriate.	Select, with prompting, and use appropriate equipment to take readings. Take precise measurements using standard units. Begin to understand the need for repeat readings.	Use a range of scientific equipment to take measurements. Take measurements with increasing accuracy and precision. Take repeat readings when appropriate.
Record		Gather and record data.	Record and communicate their findings in a range of ways and begin to use simple scientific language. Gather and record data to help answer questions.	With modelling and guidance, gather, record, classify and present data in a variety of ways to help to answer questions. With prompting, use various ways of recording, grouping and displaying	Gather, record, classify and present data in a variety of ways to help to answer questions. Record findings using simple scientific language, drawings and labelled diagrams Record findings	Take and process repeat readings. Record data and results. Record data using labelled diagrams, keys, tables and charts. Use line graphs to record data.	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar charts and line graphs.

				evidence and suggest how findings may be tabulated.	using keys, bar charts, and tables.		
Review		Recognise findings. Use their observations and ideas to suggest answers to simple questions.	Use their observations and ideas to suggest answers to simple questions.	With prompting, suggest conclusions from enquiries. Suggest how findings could be reported. Suggest possible improvements or further questions to investigate.	Report on findings from enquiries, including oral and written explanations, of results and conclusions. Report on findings from enquiries using displays or presentations. Identify differences, similarities or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer questions or to support their findings. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships. With support, present findings from enquiries orally and in writing. Suggest further comparative or fair tests.	Report and present findings from enquiries, including conclusions and causal relationships. Report and present findings from enquiries in oral and written forms such as displays and other presentations. Report and present findings from enquiries, including explanations of, and degree of, trust in results. Identify scientific evidence that has been used to support or refute ideas or arguments. Use test results to make predictions to set up further comparative and fair tests.
Area of study Biology	Reception	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
Animals including humans		Identify and name a variety of common animals including	Understand that animals, including humans, have	Identify that animals, including humans, need the right types	Describe the simple functions of the basic parts of the	Describe the changes as humans develop to old age.	Identify and name the main parts of the human circulatory

		<p>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 (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>offspring which grow into adults. Describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>and amount of nutrition, and that they 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.</p>	<p>digestive system in humans. 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.</p>		<p>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. - (see also Evolution and inheritance)</p>
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<p>Living things and their habitats</p>			<p>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 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.</p>		<p>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.</p>	<p>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.</p>	<p>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. - (see also Evolution and inheritance)</p>
<p>Plants</p>		<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe</p>	<p>Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of</p>			

		the basic structure of a variety of common flowering plants, including trees.	temperature to grow and stay healthy.	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.			
Seasonal changes		Observe changes across the four seasons - observe and describe weather associated with the seasons and how day length varies.					
Area of study Chemistry	Reception	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
Everyday materials (Y1) Uses of everyday materials (Y2)		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	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses find out how the		Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are	Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity	

<p>States of matter (Y4)</p> <p>Properties and changes of materials (Y5)</p>		<p>rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>		<p>heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>(electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes</p>	
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						associated with burning and the action of acid on bicarbonate of soda.	
Rocks				<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p>			- (see Evolution and inheritance)
Area of study Physics	Reception	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
Light (Y3 and Y6) Sound (Y4)				<p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>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.</p> <p>Recognise that</p>	<p>Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced</p>		<p>Recognise that light appears to travel in straight lines.</p> <p>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.</p> <p>Explain that we see things because light travels from light</p>

				<p>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.</p>	<p>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.</p>		<p>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.</p>
<p>Forces and magnets (Y3)</p> <p>Forces (Y5)</p>				<p>Compare how things move on different surfaces - notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>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.</p> <p>Describe magnets as having two poles.</p>		<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction that act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	

				Predict whether two magnets will attract or repel each other, depending on which poles are facing.			
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 or not the lamp is part of a complete loop with a battery.		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 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.

<p>Earth and Space</p>						<p>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.</p>	
<p>Evolution and heritage (note for Y6 - see animals including humans, living things and their habitats and rocks for how some of these aspects have been covered lower down school)</p>							<p>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</p>

							adapted to suit their environment in different ways and that adaptation may lead to evolution.
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