



Science Curriculum and Core skills

Breadth

	Key Stage 1	Key Stage 2
Working scientifically	Across all year groups scientific knowledge and skills should be learned by working scientifically.	
Biology	<p>Plants</p> <ul style="list-style-type: none"> • Identify, classify and describe their basic structure. • Observe and describe growth and conditions for growth. <p>Habitats</p> <ul style="list-style-type: none"> • Look at the suitability of environments and at food chains. <p>Animals and humans</p> <ul style="list-style-type: none"> • Identify, classify and observe. • Look at growth, basic needs, exercise, food and hygiene. <p>All living things*</p> <ul style="list-style-type: none"> • Investigate differences. 	<p>Plants</p> <ul style="list-style-type: none"> • Look at the function of parts of flowering plants, requirements of growth, water transportation in plants, life cycles and seed dispersal. <p>Evolution and inheritance</p> <ul style="list-style-type: none"> • Look at resemblance in offspring. • Look at changes in animals over time. • Look at adaptation to environments. • Look at differences in offspring. • Look at adaptation and evolution. • Look at changes to the human skeleton over time. <p>Animals and humans</p> <ul style="list-style-type: none"> • Look at nutrition, transportation of water and nutrients in the body, and the muscle and skeleton system of humans and animals. • Look at the digestive system in humans. • Look at teeth. • Look at the human circulatory system. <p>All living things</p> <ul style="list-style-type: none"> • Identify and name plants and animals • Look at classification keys. • Look at the life cycle of animals and plants. • Look at classification of plants, animals and micro-organisms.



Science Curriculum and Core skills

		<ul style="list-style-type: none"> • Look at reproduction in plants and animals, and human growth and changes. • Look at the effect of diet, exercise and drugs.
Chemistry	<p>Materials</p> <ul style="list-style-type: none"> • Identify, name, describe, classify, compare properties and changes. • Look at the practical uses of everyday materials. 	<p>Rocks and fossils</p> <ul style="list-style-type: none"> • Compare and group rocks and describe the formation of fossils. <p>States of matter</p> <ul style="list-style-type: none"> • Look at solids, liquids and gases, changes of state, evaporation, condensation and the water cycle. <p>Materials</p> <ul style="list-style-type: none"> • Examine the properties of materials using various tests. • Look at solubility and recovering dissolved substances. • Separate mixtures. • Examine changes to materials that create new materials that are usually not reversible.
Physics	<p>Light*</p> <ul style="list-style-type: none"> • Look at sources and reflections. <p>Sound*</p> <ul style="list-style-type: none"> • Look at sources. <p>Electricity*</p> <ul style="list-style-type: none"> • Look at appliances and circuits. <p>Forces</p> <ul style="list-style-type: none"> • Describe basic movements. <p>Earth and space</p> <ul style="list-style-type: none"> • Observe seasonal changes. 	<p>Light</p> <ul style="list-style-type: none"> • Look at sources, seeing, reflections and shadows. • Explain how light appears to travel in straight lines and how this affects seeing and shadows. <p>Sound</p> <ul style="list-style-type: none"> • Look at sources, vibration, volume and pitch. <p>Electricity</p> <ul style="list-style-type: none"> • Look at appliances, circuits, lamps, switches, insulators and conductors. • Look at circuits, the effect of the voltage in cells and the resistance and conductivity of materials. <p>Forces and magnets</p> <ul style="list-style-type: none"> • Look at contact and distant forces, attraction and



Science Curriculum and Core skills

		<p>repulsion, comparing and grouping materials.</p> <ul style="list-style-type: none"> • Look at poles, attraction and repulsion. • Look at the effect of gravity and drag forces. • Look at transference of forces in gears, pulleys, levers and springs. <p>Earth and space</p> <ul style="list-style-type: none"> • Look at the movement of the Earth and the Moon • Explain day and night
<p>* Items marked * are not statutory.</p>		

Learning Pathway

	Key Objective	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Working scientifically	<p>To ask questions, plan and carry out investigations</p> <p>To make and record observations</p> <p>To evaluate investigations</p>	<ul style="list-style-type: none"> • Ask simple questions. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions. 	<ul style="list-style-type: none"> • Ask relevant questions. • Set up simple, practical enquiries and comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a 	<ul style="list-style-type: none"> • Plan enquiries, including recognising and controlling variables where necessary. • Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision.



Science Curriculum and Core skills

			<p>variety of ways to help in answering questions.</p> <ul style="list-style-type: none">• Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.• Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.• Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests.• Identify differences, similarities or changes related to simple, scientific ideas and processes.	<ul style="list-style-type: none">• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models.• Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions.• Present findings in written form, displays and other presentations.• Use test results to make predictions to set up further comparative and fair tests.• Use simple models to describe scientific ideas, identifying scientific evidence that has
--	--	--	--	--



Science Curriculum and Core skills

			<ul style="list-style-type: none"> • Use straightforward, scientific evidence to answer questions or to support their findings. 	<p>been used to support or refute ideas or arguments.</p>
Biology	To understand plants	<ul style="list-style-type: none"> • Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen. • Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers. • 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. 	<ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem, 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 role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	<ul style="list-style-type: none"> • <i>Relate knowledge of plants to studies of evolution and inheritance.</i> • <i>Relate knowledge of plants to studies of all living things.</i>



Science Curriculum and Core skills

	<p>To understand animals and humans</p>	<ul style="list-style-type: none">• Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, 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 (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets).• Identify name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.• Notice that animals, including humans, have offspring which grow into adults.• Investigate and describe the basic needs of animals,	<ul style="list-style-type: none">• Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat.• Construct and interpret a variety of food chains, identifying producers, predators and prey.• Identify that humans and some animals have skeletons and muscles for support, protection and movement.• Describe the simple functions of the basic parts of the digestive system in humans.• Identify the different types of teeth in	<ul style="list-style-type: none">• 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 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.
--	---	--	--	---



Science Curriculum and Core skills

		<p>including humans, for survival (water, food and air).</p> <ul style="list-style-type: none"> • Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene. 	<p>humans and their simple functions.</p>	
	To investigate living things	<ul style="list-style-type: none"> • Explore and compare the differences between things that are living, that are dead and 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 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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 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



Science Curriculum and Core skills

		and name different sources of food.		animals based on specific characteristics.
	To understand evolution and inheritance	<ul style="list-style-type: none"> • <i>Identify how humans resemble their parents in many features.</i> 	<ul style="list-style-type: none"> • <i>Identify how plants and animals, including humans, resemble their parents in many features.</i> • <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.</i> • <i>Identify how animals and plants are suited to and adapt to their environment in different ways.</i> 	<ul style="list-style-type: none"> • 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.
Chemistry	To investigate materials	<ul style="list-style-type: none"> • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including 	Rocks and Soils	<ul style="list-style-type: none"> • Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness,



Science Curriculum and Core skills

		<p>wood, plastic, glass, metal, water and rock.</p> <ul style="list-style-type: none"> • 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. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard for particular uses. 	<p>their simple, physical properties.</p> <ul style="list-style-type: none"> • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter. <p>States of Matter</p> <ul style="list-style-type: none"> • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state 	<p>solubility, conductivity (electrical and thermal), and response to magnets.</p> <ul style="list-style-type: none"> • Understand how 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
--	--	---	---	---



Science Curriculum and Core skills

			<p>when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius ($^{\circ}\text{C}$), building on their teaching in mathematics.</p> <ul style="list-style-type: none"> • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<p>and changes of state are reversible changes.</p> <ul style="list-style-type: none"> • 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, oxidisation and the action of acid on bicarbonate of soda.
Physics	Movement, forces and magnets	<ul style="list-style-type: none"> • <i>Notice and describe how things move, using simple comparisons such as faster and slower.</i> • <i>Compare how different things move.</i> 	<ul style="list-style-type: none"> • 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. 	<p>Magnets</p> <ul style="list-style-type: none"> • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. <p>Forces</p> <ul style="list-style-type: none"> • Explain that unsupported objects fall towards the Earth because of the force



Science Curriculum and Core skills

			<ul style="list-style-type: none">• 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.• Predict whether two magnets will attract or repel each other, depending on which poles are facing.	<p>of gravity acting between the Earth and the falling object.</p> <ul style="list-style-type: none">• Identify the effect of drag forces, such as air resistance, water resistance and friction that act between moving surfaces.• <i>Describe, in terms of drag forces, why moving objects that are not driven tend to slow down.</i>• <i>Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs.</i>• Understand that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect.
--	--	--	---	---



Science Curriculum and Core skills

	<p>To understand light and seeing</p>	<ul style="list-style-type: none"> • <i>Observe and name a variety of sources of light, including electric lights, flames and the Sun, explaining that we see things because light travels from them to our eyes.</i> 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Understand 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 eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes. • 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.
	<p>To investigate sound and hearing</p>	<ul style="list-style-type: none"> • <i>Observe and name a variety of sources of sound, noticing that we hear with our ears.</i> 	<ul style="list-style-type: none"> • Identify how sounds are made, associating some 	<ul style="list-style-type: none"> • Find patterns between the pitch of a sound and



Science Curriculum and Core skills

			<p>of them with something vibrating.</p> <ul style="list-style-type: none"> • Recognise that vibrations from sounds travel through a medium to the ear. 	<p>features of the object that produced it.</p> <ul style="list-style-type: none"> • 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.
	To understand electrical circuits	<ul style="list-style-type: none"> • <i>Identify common appliances that run on electricity.</i> • <i>Construct a simple series electrical circuit.</i> 	<ul style="list-style-type: none"> • 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, 	<ul style="list-style-type: none"> • 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.



Science Curriculum and Core skills

			<p>based on whether or not the lamp is</p> <p>part of a complete loop with a battery.</p> <ul style="list-style-type: none"> • 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. 	
	To understand the Earth's movement in space	<ul style="list-style-type: none"> • <i>Observe the apparent movement of the Sun during the day.</i> • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies. 	<ul style="list-style-type: none"> • <i>Describe the movement of the Earth relative to the Sun in the solar system.</i> • <i>Describe the movement of the Moon relative to the Earth.</i> 	<ul style="list-style-type: none"> • 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



Science Curriculum and Core skills

				<p>approximately spherical bodies.</p> <ul style="list-style-type: none"> • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
<p><i>Items in italics are not statutory in the English National Curriculum.</i></p>				

End of School Expectations

By the time a child leaves St. George's Primary School they will have:

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- High levels of originality, imagination or innovation in the application of skills.
- The ability to undertake practical work in a variety of contexts, including fieldwork.
- A passion for science and its application in past, present and future technologies.

Support

P4	P5	P6	P7	P8	Early Years
-----------	-----------	-----------	-----------	-----------	--------------------



Science Curriculum and Core skills

<p>Explore objects and materials provided, changing some materials by physical means and observing the outcomes.</p> <ul style="list-style-type: none"> • Communicate awareness of changes in light, sound or movement. • Imitate actions involving main body parts. • Make sounds using their own bodies, and imitate or copy sounds. • Cause intentional movement by a pushing or pulling action. 	<ul style="list-style-type: none"> • Take part in activities focused on the anticipation of and enquiry into specific environments. • Match objects and materials with single features or properties. • Indicate the before and after of material changes. • Try out a range of equipment in familiar and relevant situations. 	<ul style="list-style-type: none"> • Recognise distinctive features of objects. • Begin to make generalisations, connections and predictions from regular experience. • Sort materials according to a single criterion when the contrast is obvious. • Observe closely changes that occur. • Identify some appliances that use electricity. • Show knowledge of some sources of sound and light. 	<ul style="list-style-type: none"> • Understand the scientific use of some simple vocabulary, such as before, after, bumpy, grow, eat and move, and communicate related ideas and observations using simple phrases. • Demonstrate simple properties of light, sound and movement. • Make simple records of findings. • Begin to make suggestions for planning and evaluating work. 	<ul style="list-style-type: none"> • Observe patterns or regular changes in features of objects, living things and events. • Make some contribution to planning and evaluation and to recording findings. • Identify a range of common materials and know about some of their properties. • Sort materials using simple criteria and communicate observations of materials in terms of these properties. • Make observations of 	<ul style="list-style-type: none"> • Know about similarities in relation to places, objects, materials and living things. • Make observations of animals and plants and explain why some things occur. • Talk about changes.
---	--	--	---	--	---



Science Curriculum and Core skills

				changes of light, sound or movement that result from actions and describe the changes when questioned.	
--	--	--	--	--	--

Challenge

Years 7, 8 and 9 – Working Scientifically

Experimental skills and investigations	Handling information and problem solving	Scientific attitudes	Measurement
<ul style="list-style-type: none">• Ask questions and develop lines of enquiry based on observations.	<ul style="list-style-type: none">• Present observations and data using appropriate methods, including tables and graphs.	<ul style="list-style-type: none">• Work objectively with concern for validity.	<ul style="list-style-type: none">• Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature.



Science Curriculum and Core skills

<ul style="list-style-type: none">• Make predictions using scientific knowledge and understanding.• Plan and design investigations and experiments to make observations and test predictions.• Identify independent, dependent and control variables and other factors to be taken into account when collecting evidence and data.• Select appropriate techniques, apparatus, and materials during fieldwork and laboratory work, working safely.• Make and record observations and measurements using a range of methods for different investigations.	<ul style="list-style-type: none">• Interpret observations and data.• Present reasoned explanations.• Evaluate data, showing awareness of potential errors.• Identify questions arising from results of investigations.	<ul style="list-style-type: none">• Understand the need for collaborative research and peer review.• Evaluate risks.	<ul style="list-style-type: none">• Use and derive simple equations.• Undertake data analysis.
---	--	---	---



Science Curriculum and Core skills

<ul style="list-style-type: none"> Evaluate the reliability of methods and suggest possible improvements. 			
--	--	--	--

Years 7, 8 and 9 – Biology

Structure and function of living organisms	Energy flow and material cycles	Interactions and interdependencies	Genetics and evolution
<p>Cells and organisation</p> <ul style="list-style-type: none"> The purpose and structure of cells. The function of parts of a cell. Movement of materials in and between cells. The organisation of multicellular organisms. <p>The skeletal and muscular systems</p>	<p>Photosynthesis</p> <ul style="list-style-type: none"> The dependence of almost all life on Earth on the transfer of solar energy. The relationship between the structures and functions of leaves. The word equation for photosynthesis. Mineral nutrition in plants. 	<p>Relationships in an ecosystem</p> <ul style="list-style-type: none"> The interdependence of organisms. How organisms affect, and are affected by, their environment. The role of variation in enabling closely related living things to survive in the same ecosystem. 	<p>Reproduction</p> <ul style="list-style-type: none"> Reproduction organs and processes in humans. Reproduction in plants. Insect pollination in human food security. <p>Inheritance, chromosomes, DNA and genes</p> <ul style="list-style-type: none"> Heredity.



Science Curriculum and Core skills

<ul style="list-style-type: none">• The structure and functions of the human skeleton.• The interaction between skeleton and muscles.• The function and actions of major muscle groups. <p>Human nutrition and digestion</p> <ul style="list-style-type: none">• Content in a healthy human diet.• Food tests for starch, simple sugars, protein and fat.• Calculations of energy requirements in a healthy daily diet.• The consequences of imbalances in the diet.• The tissues and organs of the digestive system.	<ul style="list-style-type: none">• Chemosynthesis in bacteria and other organisms. <p>Cellular respiration</p> <ul style="list-style-type: none">• Aerobic and anaerobic respiration in living organisms.• The word equation for aerobic respiration.• The process of anaerobic respiration in humans and micro-organisms, including the word equation for anaerobic respiration.• The differences between aerobic and anaerobic respiration.		<ul style="list-style-type: none">• The development of the DNA model.• Variation between individuals of different species.• Variation between individuals within a species.• Variation leading to competition which can drive adaptation.• Changes in the environment that leave some species less well adapted to compete successfully and reproduce.• The use of gene banks to preserve hereditary material.
--	--	--	---



Science Curriculum and Core skills

- The importance of bacteria in the digestive system.

The breathing (gas exchange) system

- The structure and functions of the gas exchange system in humans.
- The mechanism of breathing.
- The impact of exercise, asthma and smoking on the breathing system.

Health

- The effects of drugs (including as medicines as well as substances misuse) on behaviours.

Years 7, 8 and 9 – Chemistry



Science Curriculum and Core skills

Pure and impure substances	The particulate nature of matter	Chemical reactions	Energetics	The Periodic Table	Materials	Earth science
<ul style="list-style-type: none"> • Mixtures, including dissolving. • Techniques for separating mixtures: chromatography, filtering, evaporation and distillation. • The identification of pure substances. 	<ul style="list-style-type: none"> • The properties of the different states of matter. • Changes of state in terms of particle kinetics and energy changes. • The nature of atoms, elements and compounds. • Conservation of mass in chemical and physical change. 	<ul style="list-style-type: none"> • Chemical reactions as the rearrangement of atoms. • Representing chemical reactions using formulae and using equations. • Combustion. 	<ul style="list-style-type: none"> • Chemical reactions. • Acids, alkalis and neutralisation. • Defining acids, bases and alkalis. • The pH scale for measuring acidity/alkalinity. • Reactions of acids with bases and metals. 	<ul style="list-style-type: none"> • The Periodic Table: periods and groups; metals and non-metals. • How patterns in reactions can be explained and predicted with reference to the Periodic Table. • The varying physical and chemical properties of different elements. • The chemical properties of 	<ul style="list-style-type: none"> • The order of metals and carbon in the reactivity series. • The use of carbon in obtaining metals from metal oxides. • Ceramics, polymers and composites. 	<ul style="list-style-type: none"> • The composition of the Earth and the atmosphere. • Changes to the Earth's atmosphere since its formation. • The production of carbon dioxide by human activity and the impact on climate and the efficacy of recycling.



Science Curriculum and Core skills

				metals and non-metals.	
--	--	--	--	------------------------	--

Years 7, 8 and 9 – Physics

Energy	Motion and forces	Waves	Electricity and electromagnetism	Matter
<p>Changes and transfers</p> <ul style="list-style-type: none"> • Processes that cause change, with forces, with matter and with electricity. • Calculations comparing ratings of appliances in kilowatts (kW) and amounts of energy from different foods. • Fuel, fuel sources and heating. 	<p>Describing motion</p> <ul style="list-style-type: none"> • Speed and the relationship between average speed, distance and time (speed = distance ÷ time). • The representation of a journey on a distance-time graph. • Relative motion. <p>Forces</p> <ul style="list-style-type: none"> • Forces arising from the 	<p>Observed waves</p> <ul style="list-style-type: none"> • Waves on water. <p>Sounds waves</p> <ul style="list-style-type: none"> • Frequencies of sound waves. • The speed of sound in air. • Sound produced by vibrations of objects. • Auditory range. <p>Energy and waves</p>	<p>Current electricity</p> <ul style="list-style-type: none"> • Electric current. • Current as flow of charge. • Potential difference and resistance. • Differences in resistance between conducting and insulating components. <p>Static electricity</p> <ul style="list-style-type: none"> • Separation of positive or negative 	<p>Physical changes</p> <ul style="list-style-type: none"> • Conservation of material and of mass. • Similarities and differences between solids, liquids and gases. • Brownian motion in gases. • Diffusion in liquids and gases. • The difference between chemical



Science Curriculum and Core skills

<p>Auditing change</p> <ul style="list-style-type: none"> • Audit calculation using measures of change in energy. • Rates of change measured in kW. 	<p>interaction between two objects.</p> <ul style="list-style-type: none"> • Moments. • Measurement of forces in Newtons. • Hooke's Law. • Gravity forces acting at a distance on Earth and in space. <p>Pressure forces</p> <ul style="list-style-type: none"> • Atmospheric pressure. • Pressure in liquids, including upthrust effects, floating and sinking. • Pressure measured by ratio of force over area - acting in all directions. 	<ul style="list-style-type: none"> • Sound waves carrying energy. <p>Light waves</p> <ul style="list-style-type: none"> • The similarities and differences between light and waves. • Light waves travelling through a vacuum and the speed of light. • The transmission of light through materials. • The refraction of light and the human eye. • Light transferring energy. • Colour and the different frequencies of light. 	<p>charges when objects are rubbed together.</p> <ul style="list-style-type: none"> • The idea of electric field forces acting across the space between objects not in contact. <p>Magnetism</p> <ul style="list-style-type: none"> • Magnetic poles, attraction and repulsion. • Magnetic fields. • The magnetic effect of a current, electromagnets, D.C. motors. 	<p>and physical changes.</p> <p>Particle model</p> <ul style="list-style-type: none"> • The differences in arrangements, in motion and in closeness of particles, explaining changes of state, shape and density. • Atoms and molecules as particles. <p>Energy in matter</p> <ul style="list-style-type: none"> • Changes of temperature in motion and spacing of particles. • Internal energy stored in materials.
--	--	---	--	--



Science Curriculum and Core skills

	<p>Balanced forces</p> <ul style="list-style-type: none">• Opposing forces and equilibrium. <p>Forces and motion</p> <ul style="list-style-type: none">• The role of forces in causing motion or changes in motion.			
--	---	--	--	--