

# Science

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The national curriculum for science aims to ensure that all pupils:

- 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.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

## KS1 Pupils should be taught:

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study, but must always be taught through

## Lower KS2 Pupils should be taught:

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes

## Upper KS2 Pupils should be taught:

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.

and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

### Intent

At St James' all pupils will leave with an understanding of the important scientific knowledge and be able to use and apply scientific skills to understand the world that they are part of. The children will have an understanding of natural animal and human world, how we have evolved from the beginning of time, and the application of science in our everyday lives. They will have used a range of engaging resources, actively engaged in scientific discovery and explored key scientists from a range of backgrounds and cultures as well as studying modern world climate and scientific issues. The children will also know about some relevant scientist and the impact they have had on the world.

All children will have had the opportunity to present their own work in a range of ways as well as develop their scientific skills to discuss, analyse, measure, classify and question, before presenting their findings. Working practically Explore and investigate, children will work collaboratively and systematically to answer a question.

Children will begin by developing an understanding of plants, themselves, the world around them, animals and materials in KS1 and then build on this in KS2 by making links to the wider world and current issues, including the climate, pollution and sources of energy, deepening their understanding and questioning of their previous learning.

Through teaching and learning in science, children will gain an understanding of the world locally and globally and the challenges the modern world is facing. Scientific skills such as questioning, testing, analysing, predicting and concluding will prepare the children for life in an increasingly complex modern world

### Implementation

To ensure high standards of teaching and learning in science we implement a curriculum that is progressive throughout the whole school. We use the Kent Science Scheme to support planning. Science is taught weekly through sequential and coherent patterns which build upon previous learning. Science focuses on the knowledge and skills stated in the National Curriculum. Pupils are encouraged to apply their Scientific skills in all areas of the curriculum, questioning their understanding of the world they experience, and developing ways to explore and answer their questions and to provide possible solutions which can be tested. Teachers plan lessons for their class using our progression of knowledge and skills documents. This progression document ensures the curriculum is covered and the skills/knowledge taught are progressive from year group to year group.

### Impact

Our Science Curriculum is high quality, well thought out and is planned to demonstrate progression. If children are keeping up with the curriculum, they are deemed to be making good or better progress. At St James' we measure the impact through regular assessment opportunities, discussions with the children and through evidencing the skills and knowledge within the children's written and practical learning. The children will be able to select appropriately from a variety of techniques to investigate and provide answers to questions, making links to the local and wider world.

YR

Y1

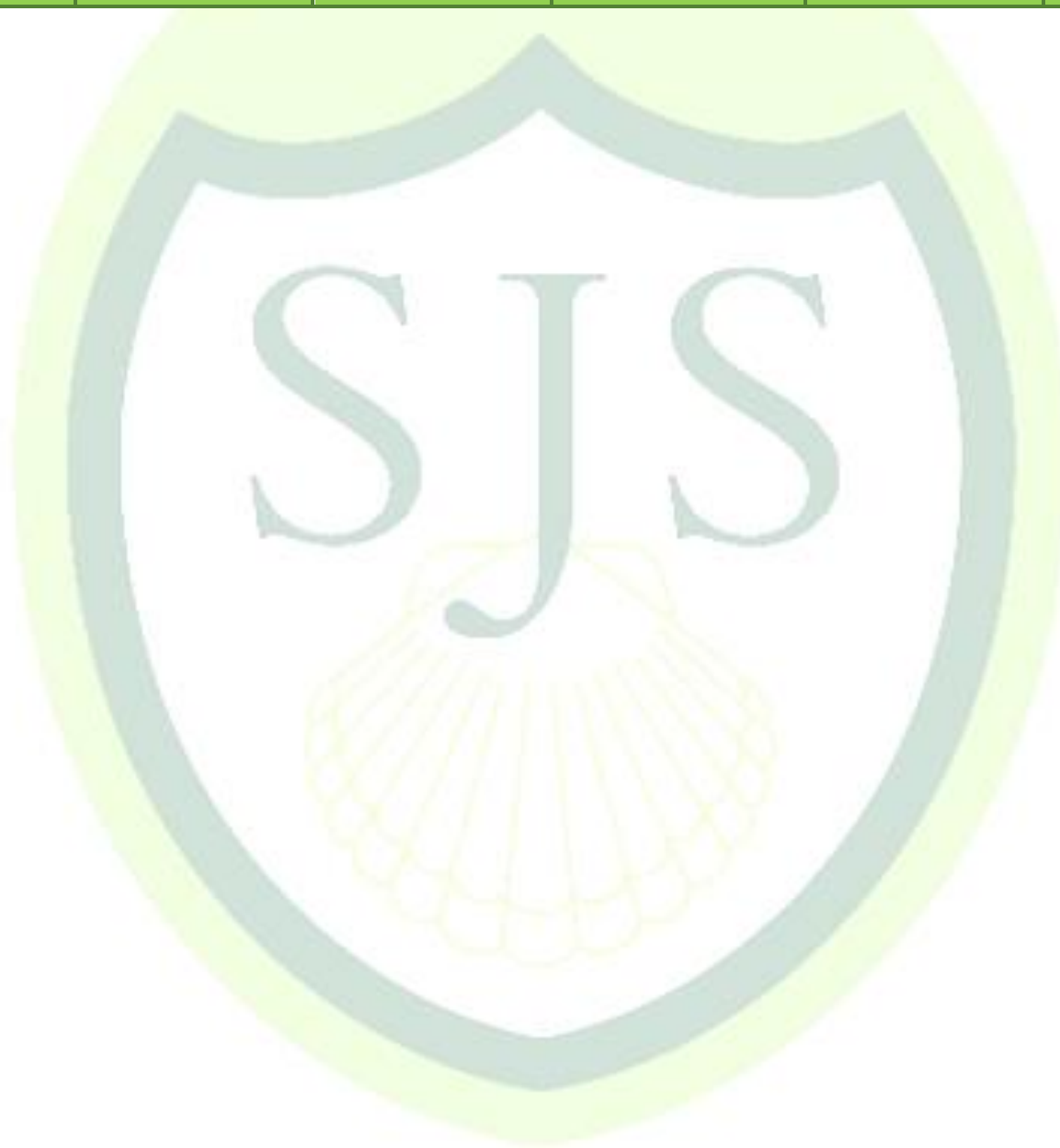
Y2

Y3

Y4

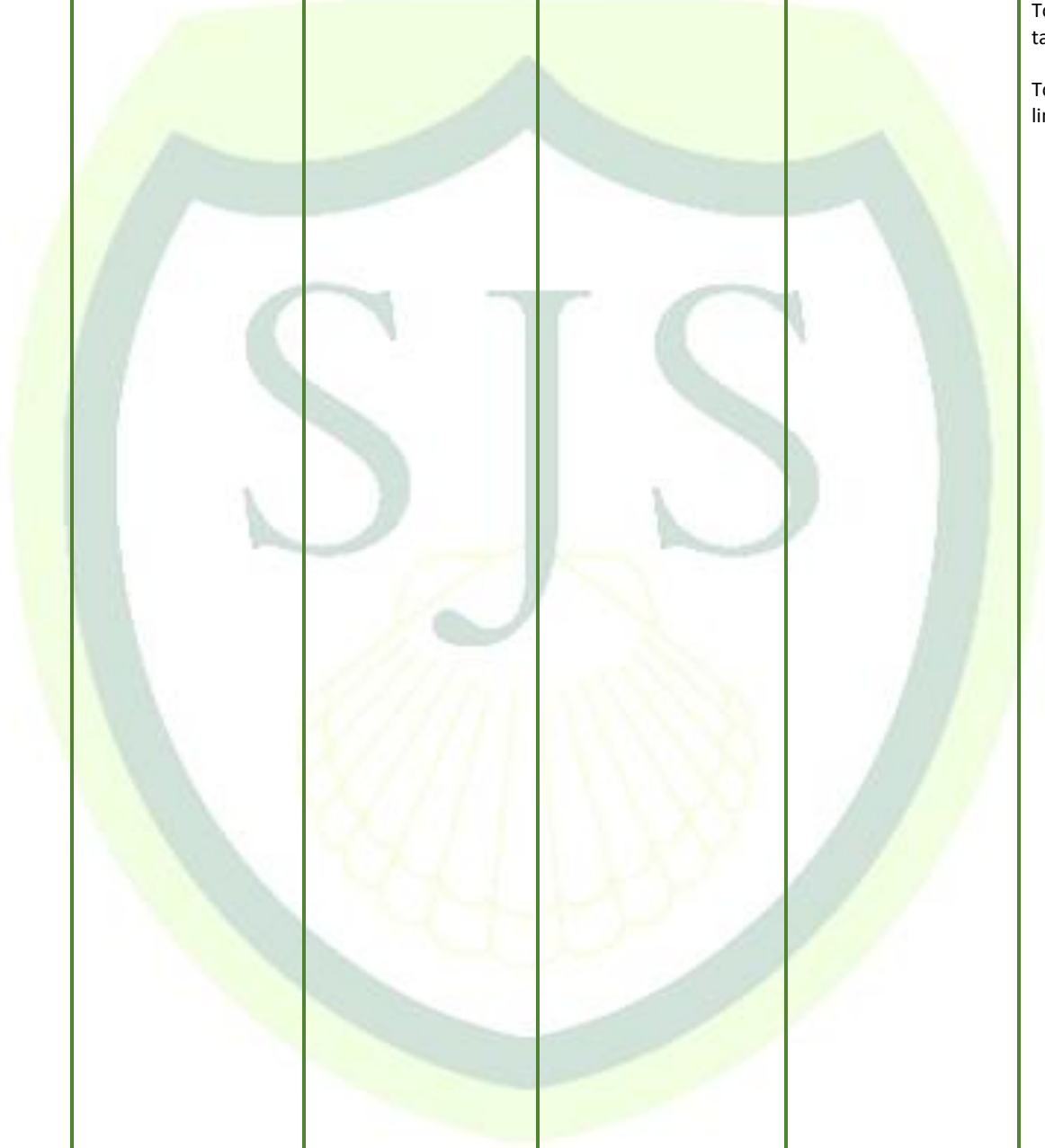
Y5

Y6



<p><b>Working Scientifically</b></p>	<p>Explore the natural world around them.</p>	<p>Observe closely, and use simple description. (plants, animals and materials)</p>	<p>To identify and classify a variety of plants, Using scientific vocabulary.</p>	<p>To set up a simple practical enquiry.</p>	<p>To use a scientific enquiry to answer a question.</p>	<p>Plan a scientific enquiry to answer a question.</p>	<p>To identify scientific evidence that has been used to support or refute ideas or arguments.</p>
<p>Questions <b>observe</b></p>	<p>Recognise what difference means.</p>	<p>Observe closely using simple equipment. (plants, animals and materials)</p>	<p>To identify and classify a variety of animals, Using scientific vocabulary.</p>	<p>To make systematic and careful observations.</p>	<p>To set up a simple practical enquiry.</p>	<p>To report a presentation of an explanation.</p>	<p>To take repeated accurate measurements using a stopwatch.</p>
	<p>Recognise what similar means.</p>	<p>To engage with texts and use a variety of sources to research (internet, library, databases)</p>	<p>To identify and classify a variety of materials Using scientific vocabulary.</p>	<p>To gather and record data.</p>	<p>To make systematic and careful measurements with a data logger.</p>	<p>Plan the correct enquiry to answer a question.</p>	<p>To explain the degree of trust in results.</p>
	<p>Observe changes in the natural world around them.</p>	<p>To ask simple questions about their world and the world around them (what I can see, smell, taste, touch etc.)</p>	<p>To explain that questions can be answered in different ways.</p>	<p>To use results to draw simple conclusions.</p>	<p>To report on findings from an enquiry.</p>	<p>Recognise which secondary sources will be most useful to their research (non-statutory).</p>	<p>To use test results to make predictions to set up further fair-tests.</p>
	<p>To offer explanations for why things might happen.</p>	<p>To recognise that questions can be answered in different ways.</p>	<p>Observe using equipment. (E.G. Microscopes, magnifying glasses etc.)</p>	<p>To use straightforward scientific evidence to answer questions or to support their findings.</p>	<p>To identify differences, similarities or changes related to simple scientific ideas.</p>	<p>To use scientific diagrams and labels.</p>	<p>Plan a fair-test; identifying the control variables.</p>
	<p>To make observations about the natural world around them.</p>	<p>To perform simple tests.</p>	<p>Describe observations using scientific language.</p>	<p>To discuss and perform a simple fair-test.</p>	<p>To set up simple fair tests.</p>	<p>To explain findings.</p>	<p>Plan an enquiry that will answer a question.</p>
	<p>Explore similarities and differences between contrasting environments.</p>	<p>To make a simple prediction based on experiment.</p>	<p>Explore answers to questions.</p>	<p>To record findings in a bar chart.</p>	<p>To gather, record, classify and present data in a variety of ways to help in answering questions.</p>	<p>To take accurate measurements using a data-logger.</p>	<p>To record data in a table.</p>
	<p>Explore some similarities and differences of environments, drawing on their experiences and what has been read in class.</p>	<p>To use simple equipment to measure length, time, capacity, weight) using non-standard units.</p>	<p>To ask questions with relevance to a topic.</p>	<p>To use results to draw simple conclusions.</p>	<p>To report on findings from enquiries, including oral and written explanations.</p>	<p>To measure accurately using a thermometer.</p>	<p>To measure with a data logger.</p>
	<p>To understand some important processes and changes in the natural world around them.</p>	<p>To use scientific vocabulary to describe</p>	<p>To gather and record data to help in answering questions.</p>	<p>To provide an oral explanation of findings.</p>	<p>To use results to draw simple conclusions.</p>	<p>To take repeated accurate measurements using a stopwatch.</p>	<p>To present findings from an enquiry.</p>
	<p>ELG: Know some similarities and differences between the natural world</p>	<p>To use simple prediction based on experiment.</p>	<p>To ask questions with relevance to a topic.</p>	<p>To make systematic and careful observations.</p>	<p>To use results to draw simple conclusions.</p>	<p>To record data in a line graph.</p>	<p>Recognise which secondary sources will be most useful to research ideas (non-statutory).</p>
		<p>To use simple equipment to measure length, time, capacity, weight) using non-standard units.</p>	<p>To gather and record data to help in answering questions.</p>	<p>To make careful observations.</p>	<p>To use a data logger to take accurate measurements.</p>	<p>To use test results to make predictions to set up further comparative and fair tests.</p>	<p>To use scientific evidence to support or refute on idea.</p>
		<p>To use simple equipment to measure length, time, capacity, weight) using non-standard units.</p>	<p>To gather and record data to help in answering questions.</p>	<p>To set up simple comparative tests.</p>			
		<p>To use simple equipment to measure length, time, capacity, weight) using non-standard units.</p>	<p>To gather and record data to help in answering questions.</p>	<p>To measure using beakers and syringes.</p>			
		<p>To use simple equipment to measure length, time, capacity, weight) using non-standard units.</p>	<p>To gather and record data to help in answering questions.</p>				

	<p>around them and contrasting environments, drawing on their experiences and what has been read in class</p>	<p>an event or observation.</p> <p>To gather and record simple data in order to answer a question.</p> <p>To complete pre-prepared tables and graphs.</p> <p>To use simple labels for diagrams.</p>	<p>discussion. (internet, library, databases)</p> <p>To perform simple tests.</p> <p>To create charts and tables.</p> <p>To label diagrams using scientific vocabulary.</p> <p>To use simple measurements to gather data. (non-statutory)</p> <p>To use simple secondary sources Find answers (non-statutory).</p> <p>To talk about what they have found out and how they found it out. (non-statutory).</p> <p>To notice relationships with help (non-statutory).</p> <p>To sort objects using observable features. (non-statutory).</p> <p>To record data in a tally chart, bar chart, flow diagram. (non-statutory).</p>	<p>To present information in a branching key.</p>	<p>To use a thermometer to take accurate measurements.</p> <p>To provide a written explanation.</p> <p>To use straightforward scientific evidence to answer questions or to support their findings.</p> <p>To record findings using labelled diagrams.</p> <p>To use written explanations to report on findings from an enquiry.</p> <p>To identify the correct type of enquiry to answer a question.</p> <p>To set up a comparative test.</p> <p>To use evidence to support findings.</p>	<p>To report and present findings from enquiries, including conclusions, causal relationships and explanations.</p> <p>Recognise control variables when planning a fair-test.</p> <p>To evaluate an enquiry in terms of the amount of trust one can have in it.</p> <p>To identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>To explain the degree of trust in results.</p> <p>To use test results to make predictions to set up further fair-tests.</p> <p>To raise different types of questions (non-statutory).</p> <p>To communicate data using a scatter graph.</p> <p>To present conclusions.</p> <p>To use evidence to refute or support an idea.</p>	<p>To use test results to make predictions to set up further comparative tests.</p> <p>Plan a fair-test; recognising and controlling variables.</p> <p>Plan a scientific enquiry to answer a questions.</p> <p>To report as to the degrees of trust in results.</p> <p>To take repeat measurements of data with precision using a data-logger.</p> <p>To explain the degree of trust can be had in results.</p> <p>Plan a fair-test by recognising the control variables.</p> <p>To use predictions to set up fair tests.</p> <p>Plan pattern-seeking enquiry.</p> <p>To report causal relationships.</p> <p>To record results using a line graph.</p> <p>To present findings from enquiries.</p>
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To record data within tables.

To record data using line graphs.

	YR	Y1	Y2	Y3	Y4	Y5	Y6	
Plants	<p>To name types of plants (e.g. flower, tree)</p> <p>Observe features of plants.</p> <p>Observe changes in plants.</p> <p>To talk about why some things occur.</p> <p>To identify similarities between different plants.</p> <p>To identify differences between different plants.</p> <p>Observe and draw pictures of plants.</p> <p>To develop an understanding of growth, decay and changes over time.</p> <p>ELG: 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</p> <p>ELG: Explore the natural world around them, making</p>	<p>To identify different types of plants. E.g. tree, flower, grass</p> <p>To sort plants into different categories. E.g. flower, tree</p> <p>To identify a variety of common, wild and garden plants.</p> <p>Explore trees that lose their leaves and those that don't.</p> <p>To identify deciduous trees and ever green trees.</p> <p>To classify trees as deciduous and evergreen.</p> <p>To investigate the basic structure of a tree.</p> <p>To investigate the basic structure of a variety of common plants and including roots, stem/trunk, leaves and flowers.</p>	<p>To identify that all plants start as seeds/ bulbs.</p> <p>To explain that plants grow from seeds (and bulbs).</p> <p>To identify a bulb is a seed.</p> <p>Observe and describe how seeds grow into mature plants.</p> <p>Observe how bulbs grow into mature plants.</p> <p>Observe what plants need to survive. I.e. Water, light and a suitable temperature to grow and stay healthy.</p> <p>To investigate what plants need to grow and survive.</p> <p>To identify that plants need Water, light and a suitable temperature to grow and stay healthy.</p> <p>To explain what a plant needs to grow and survive.</p>	<p>To identify and describe the function of the roots.</p> <p>To investigate the ways in which water is transported within plants.</p> <p>To identify and describe the function of the stem.</p> <p>To identify and describe the function of the leaves.</p> <p>To identify and describe the function of the flower.</p> <p>Describe the requirements of plants for life and growth (air, light, water, nutrients from soil).</p>				

	observations and drawing pictures of animals and plants						
	YR	Y1	Y2	Y3	Y4	Y5	Y6
Animals including humans	<p>To name a variety of animals.</p> <p>Observe features of animals.</p> <p>Observe changes in animals.</p> <p>To identify similarities between different animals.</p> <p>To identify differences between animals.</p> <p>Observe and draw pictures of animals.</p> <p>Observe features of humans</p> <p>To identify similarities and differences between humans.</p> <p>Observe and draw pictures of humans.</p> <p>To observe changes to humans over time.</p> <p>To draw on experiences and what has been read in class.</p> <p>ELG: Know some similarities and</p>	<p>To identify features of a variety of common animals that are birds, fish, amphibians, reptiles and mammals.</p> <p>Describe features of a variety of common animals that are birds, fish, amphibians, reptiles and mammals.</p> <p>To compare features of a variety of common animals that are birds, fish, amphibians, reptiles and mammals.</p> <p>To sort features of a variety of common animals that are birds, fish, amphibians, reptiles and mammals.</p> <p>To identify that animals eat different things.</p> <p>To identify the things that animals, including humans, eat.</p> <p>To identify and name a variety of common animals that are carnivores, herbivores and omnivore.</p> <p>To compare a variety of common animals</p>	<p>Observe that animals, including humans, have offspring that grow into adults.</p> <p>To explain that human offspring grow into adults.</p> <p>To discuss how different animals including humans, change into adults.</p> <p>To identify the basic needs of animals including humans for survival (water, food and air).</p> <p>To describe the basic needs of animals including humans for survival (water, food and air).</p> <p>To explain the basic needs of animals including humans for survival (water, food and air).</p> <p>To explore the basic food groups.</p> <p>To explore the importance for humans of eating the right amounts of different types of food.</p>	<p>To know that animals cannot make their own food.</p> <p>To know that animals, including humans, need the right amounts and types of food.</p> <p>To know the ways in which nutrients and water are transported within animals, including humans.</p> <p>To know that humans and some animals have skeletons and muscles for support, protection and movement.</p>	<p>To identify the different types of teeth in humans.</p> <p>Describe functions of the different types of teeth in humans.</p> <p>To identify the basic parts of the digestive system in humans.</p> <p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Describe the function of the stomach.</p> <p>Describe the function of the intestines.</p> <p>Describe the function of the liver.</p> <p>Describe the function of the kidneys.</p> <p>Describe how waste is produced in the digestive system.</p>	<p>Describe the changes as humans develop from birth to old age.</p> <p>Describe a human at birth and how their birth weight might affect how they grow.</p> <p>Describe the stages of human life</p> <p>To compare the stages of human life with other animals.</p> <p>To identify developmental steps and changes.</p> <p>Describe what happens to the body as it gets older.</p> <p>To identify changes as a human goes through puberty.</p>	<p>To Identify and name the main parts of the human circulatory system.</p> <p>To explain the functions of the heart.</p> <p>To explain the functions of blood vessels and blood.</p> <p>Describe the ways in which nutrients and water are transported within animals.</p> <p>Describe the ways in which nutrients and water are transported within humans.</p> <p>To explain the functions of blood vessels and blood.</p> <p>Describe the ways in which nutrients and water are transported within animals.</p> <p>Describe the ways in which nutrients and water are transported within humans.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p>



	<p>differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p> <p>ELG: Explore the natural world around them, making observations and drawing pictures of animals and plants</p>	<p>that are carnivores, herbivores and omnivore.</p> <p>To sort a variety of common animals that are carnivores, herbivores and omnivore.</p> <p>Describe the structure of a variety of common animals.</p> <p>To compare the structure of a variety of common animals.</p> <p>To identify and name the basic parts of the human body.</p> <p>To label the basic parts of the human body.</p> <p>To draw the basis parts of the human body.</p> <p>To identify which part of the body is associated with each sense.</p>	<p>To identify the importance for humans of exercise.</p> <p>To identify the importance to humans of hygiene.</p>				
	<b>YR</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>	<b>Y6</b>
Living things and their habitats	<p>To talk about some of the things they have observed such as animals and natural objects.</p> <p>To ask questions about the natural world.</p>		<p>To identify things that are living and dead</p> <p>To identify things that have never been alive.</p> <p>To compare things that are living, dead and those that have never been alive.</p>		<p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p>	<p>To explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>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.</p> <p>Describe how living things are classified into broad groups</p>

	<p>To show care and concern for living things and their environments.</p> <p>Begin to understand the effect their behaviours can have on the environment.</p> <p>Looks closely at similarities and differences in changes to living things.</p> <p>To make observations of animals and explain why some things occur and talk about changes.</p> <p>Recognise some environments that are different from the one in which they live.</p> <p>ELG: Explore the natural world around them, making observations and drawing pictures of animals and plants</p>		<p>To compare the differences between things that are living, dead and those that have never been alive.</p> <p>To identify what a habitat is.</p> <p>To identify habitats of different living things.</p> <p>Explore different types of habitat.</p> <p>To identify and name a variety of plants and animals in different habitats.</p> <p>Describe what different animals eat.</p> <p>Describe how living things are suited to their habitat.</p> <p>To investigate how habitats provide for the basic needs of different plants and animals.</p> <p>Describe how living things depend on each other.</p> <p>To investigate different sources of food for different animals.</p> <p>To sort animals by the foods they eat.</p> <p>To identify a simple food chain.</p>		<p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>		<p>based on similarities and differences.</p> <p>Describe how living things are classified into broad groups including micro-organisms, plants and animals.</p> <p>To give reasons for classifying plants and animals based on specific characteristics.</p> <p>To make a key to classify plants.</p>
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	YR	Y1	Y2	Y3	Y4	Y5	Y6
			Explore food chains for different animals.  To explain a simple food chain.				
Materials  Changing states of matter  Rocks	Recognise how things can be changed (heating, cooling).  To identify what similar means.  To understand some important processes and changes in states of matter e.g melting, freezing.  To explain why some changes happen.  Recognise different materials in a familiar environment.  To name different materials.  Explore the natural world around them.  Explore touch, smell, hear through hands on experiences.  ELG: Understand some important processes and changes in the natural world around them, including the	To identify a variety of objects.  Observe similarities and differences in relation to objects.  To identify what an object is made from.  Describe an object using your senses.  To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.  To distinguish between an object and the materials from which it is made.  To explain what properties of materials means.  To identify the simple physical properties of a variety of everyday materials. E.g. hard, bendy.  To investigate physical properties of materials by performing simple	To identify a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.  To explain what properties of materials means.  To identify the uses of everyday materials.  To compare the properties of everyday materials. Explore why materials are used for their purpose.  To suggest ways to change a material.  Explore out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.  To investigate if the properties of a material can be changed by squashing, bending, twisting, folding etc.	To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.  Recognise that soils are made from rocks and organic matter.  Describe in simple terms how fossils are formed when things that have lived are trapped within rock.	Compare and group materials together, according to whether they are solids, liquids or gases.  Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).  Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	To compare and group together everyday materials based on evidence from comparative and fair tests, including their conductivity of heat.  To understand that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.  To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.  To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.  To demonstrate that dissolving, mixing and	

	seasons and changing states of matter	<p>tests. E.G. floating and sinking.</p> <p>To compare a variety of everyday materials on the basis of their simple properties.</p> <p>To sort a variety of everyday materials on the basis of their simple properties</p> <p>Describe the simple physical properties of a variety of everyday materials. E.g. hard, bendy.</p>	<p>To suggest reasons to change the shape of a material.</p> <p>Explore a greater range of properties of materials. E.g. bending, stretching, pressure, strength.</p> <p>To compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>To explain why materials are used for their purpose.</p> <p>To suggest reasons for any changes in the material when the shape is changed.</p>			<p>changes of state are reversible changes.</p> <p>To 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.</p>	
	<b>YR</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>	<b>Y6</b>
Seasonal changes	<p>Explore the seasons.</p> <p>To talk about the similarities and differences between seasons.</p> <p>Explore the weather during different seasons.</p> <p>To explain why some changes happen (e.g. why leaves fall from trees)</p>	<p>To Identify and name the four seasons.</p> <p>To compare the months of the four seasons.</p> <p>Describe the weather associated with each season.</p> <p>Observe how the length of day changes with the seasons.</p>	<p>To Identify and name the four seasons.</p> <p>To name and compare the months of the four seasons.</p> <p>Describe the weather associated with each season.</p> <p>To explain the changes in weather associated with each season.</p> <p>Describe why the length of day changes with the seasons.</p>				

	<p>To understand some important process and changes in the seasons.</p> <p>Describe what they see, hear and feel whilst outside.</p> <p>ELG: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p>	Observe changes across the four seasons.	<p>To explain why the length of day changes with the seasons.</p> <p>To record weather (including temperature) changes across the four seasons.</p> <p>Describe the changes in weather (including temperature) changes across the four seasons.</p> <p>To record changes in plants across the four seasons.</p> <p>Describe changes in plants across the four seasons.</p> <p>To record changes in animals (behaviour, habits, looks) across the four seasons.</p>				
	<b>YR</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>	<b>Y6</b>
Light	<p>Explore light, projected image.</p> <p>Explore light travelling through transparent materials.</p> <p>Explore an object casting a shadow.</p>			<p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>To notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object.</p>		Earth and Space has some links	<p>Recognise that light appears to travel in straight lines.</p> <p>To 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>To 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>

				Find patterns in the way that the sizes of shadows change.			To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
	YR	Y1	Y2	Y3	Y4	Y5	Y6
Electricity	<p>Recognise different sources of equipment in school that need power to work.</p> <p>To recall different sources of equipment in the home that need power to work.</p>				<p>To identify common appliances that run on electricity.</p> <p>To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>To 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.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p>		<p>To use recognised symbols when representing a simple circuit in a diagram.</p> <p>To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>To compare how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p> <p>To give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p>
	YR	Y1	Y2	Y3	Y4	Y5	Y6

Forces and Magnets	<p>Explore and talk about different forces they can feel.</p> <p>Explore a magnet attracting an object.</p> <p>Explore floating and sinking.</p>			<p>To compare how things move on different surfaces.</p> <p>To 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>To notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others. Describe magnets as having two poles.</p>		<p>To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>To 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>	
	YR	Y1	Y2	Y3	Y4	Y5	Y6
Sound	<p>Explore sense of hearing.</p> <p>Explore a range of different sounds.</p> <p>Begin to identify a range of items from the sound they make.</p>				<p>To identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from a sound travel through a medium to the ear.</p>		

	<p>Explore the different levels of sound.</p> <p>Begin to identify sounds in terms of loud and quiet.</p> <p>Explore a sound causing a vibration.</p>				<p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>		
	YR	Y1	Y2	Y3	Y4	Y5	Y6
<p>Earth and Space</p> <p>Links to light and seasonal changes</p>	<p>Explore where we live e.g Earth.</p> <p>To talk about day and night.</p>					<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>To use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.</p>	
	YR	Y1	Y2	Y3	Y4	Y5	Y6



<p>Evolution and inheritance</p>	<p>Explore the difference between babies, children and adults.</p> <p>To share own ideas and identify similarities and differences between ages.</p> <p>Explore different stages of development and what we can do.</p> <p>Recognise similarities and difference in relation to family.</p>						<p>Recognise that living things have changed over time.</p> <p>Recognise that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind.</p> <p>Recognise that living things offspring vary and are not identical to their parents.</p> <p>To identify how animals and plants are adapted to suit their environment in different ways.</p> <p>To identify that adaptation may lead to evolution.</p>
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## Key Vocabulary

	YR	Y1	Y2	Y3	Y4	Y5	Y6
<p><b>Working scientifically</b></p>	<p>Name</p>	<p>Identify Notice Hear, see, taste, touch, smell Hard/ soft What, how, why Because Table compare</p>	<p>Describe Observe Sort Label Test</p>	<p>Data Measure Record Investigate Explain variables Data logger Chart graph</p>	<p>Systematic Conclusion Evidence Scientific Predict Diagram Fair test independent variables Dependent variables</p>	<p>Precision Findings Evaluate Causal relationships control Report</p>	<p>Support Refute</p>

					Line graph		
<b>Plants</b>		<p>Trees - deciduous, evergreen, oak, horse chestnut, apple, willow, sycamore, fir, pine, holly, etc</p> <p>Wild flowering plants - daisy, dandelion, clover,</p> <p>Garden plants – crocus, daffodil, bluebells, etc</p> <p>Parts of plants – roots, branch, trunk, leaf, flower, petal, seeds, twigs</p>	<p>Trees - ash, birch, beech, common lime,</p> <p>Garden plants – rose, grass, vegetable plants such as potato, tomato, strawberry</p> <p>Parts of plants – bulbs, stalk,</p> <p>Need of plants – water, light, heat, soil, temperature</p>	<p>Trees rowan, common lime, sweet chestnut, horse chestnut, cherry</p> <p>Wild flowering plants - cleavers, coltsfoot, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd's purse, sorrel, spear thistle, white campion, white deadnettle and yarrow.</p> <p>Garden plants – crocus, Fushia</p> <p>Parts of a flower – stamen (anther + filament), carpel (stigma + style + ovary + ovule)</p> <p>Processes – pollination, fertilisation, germination</p>			
<b>Animals including humans</b>		<p>Birds, fish, amphibians, reptiles, mammals</p> <p>· Feathers, scales, gills, fins, hair, land, water, bones, skeleton</p> <p>Carnivores, herbivores, omnivores</p> <p>· Meat, plants</p> <p>· (Common parts/structures of animals)</p> <p>· (Names of animals that can be found in the school grounds) Badger, fox, squirrel, woodpecker, pigeon, rat, newt, bee, pond skater,</p>	<p>· Stages of growth of many insects – egg, larva, pupa, adult</p> <p>· invertebrates – ladybirds, butterflies, dragonflies, etc</p> <p>· amphibians – smooth newt, common frog, toad</p> <p>· Stages of life –baby, toddler, child, teenager, adult</p> <p>· growth, nutrition, respiration (breathing is part of this)</p> <p>· Hygiene – clean, wash, germs</p> <p>· healthy, grow, strong, energy</p>	<p>Nutrition Diet Vitamins, minerals, fats, proteins and carbohydrates</p> <p>skeletons – protect, support and aid movement, joints, hinge, ball and socket</p> <p>ribs, spine, skull,</p>	<p>Digestive system –, oesophagus, stomach, acid, small intestine</p> <p>Protein, vitamin, mineral, carbohydrate, fats, energy, growth, repair. Saliva</p> <p>Teeth – Incisors, canines, premolars, molars</p> <p>Function Foodchain – producer, consumer, predator, prey</p>	<p>Gestation</p> <p>Foetus</p> <p>Fertilisation</p> <p>Species</p> <p>Baby</p> <p>Toddler</p> <p>Adolescent</p> <p>Adult</p> <p>Elderly person</p> <p>Puberty</p> <p>Hormones</p> <p>Pituitary gland</p>	<p>Circulatory system – heart, blood, veins, arteries, pulse, clotting</p> <p>Diet – balanced, vitamins, minerals, proteins, carbohydrates, sugars, fats</p> <p>Drugs – caffeine, nicotine, alcohol, cannabis, cocaine, heroine</p> <p>Lifestyle healthy, unhealthy</p>

		· dog, puppy, cat, kitten parrot, hamster , rabbit					
<b>Living things and their habitats</b>			<p>Habitat, micro habitat Pond, meadow, log pile, woodland, river, plant,</p> <p>Trees - ash, birch, beech, common lime,</p> <p>Garden plants – rose, grass, vegetable plants such as potato, tomato, strawberry, sunflower</p> <p>Parts of plants – bulbs, stalk,</p> <p>Need of plants – water, light, heat, soil, temperature</p> <p>Invertebrates – snail, slug, woodlouse, spider, beetle, fly,</p> <p>Pond animals – pond skater, snail, pond snail, leech, common frog, newt</p>		<p>Habitat, lake, beach, cliff Organism Trees – elder, laurel, silver birch, copper birch, holm oak,</p> <p>Wild flowering plants - cleavers, coltsfoot, daisy, dandelion, garlic mustard, mallow, mugwort, plantain, red clover, self heal, shepherd’s purse, sorrel, spear thistle, white campion, white deadnettle and yarrow.</p> <p>Garden plants – clematis, chamelion, geranium, marigold,</p> <p>Invertebrates –</p> <p>Pond animals – water slater, ramshorn snail, smooth newt, nymph</p>	<p>development – egg, larva, pupa, nymph, adult, metamorphosis Parts of a flower – petal, stamen (anther + filament), carpel (stigma + style + ovary + ovule) Processes – pollination, fertilisation, germination</p>	<p>Vertebrate, invertebrate Kingdoms: ‘micro-organism’ Species Prokaryotes • Bacteria • Blue-green algae • Protoctists • Amoeba • Paramecium Kingdom Protoctista . Fungi • Moulds • Mushrooms • Yeast</p>
<b>Materials</b>	Senses: touch, see, hear, smell and taste	Types of materials: wood, plastic, glass, metal, water, rock, brick, fabric, sand, paper, flour, butter, milk, soil hard/soft, stretchy/not stretchy bend, cut, stretch, twist	Types of materials: polystyrene, silver, gold, iron, natural sponge, cardboard, jelly, oil elastic, dull, transparent/not transparent, sticky/not sticky, crumble, squash, wring, squeeze	Names of rocks – Chalk, limestone, granite, basalt, sandstone, flint, slate, shale, marble Types of rock – Sedimentary, metamorphic, igneous Types of minerals – Calcite, feldspar, topaz, diamond, talc, corundum Properties of	States of matter - Solid, liquid and gas Examples of gases (at room temperature and pressure) – Oxygen, hydrogen, helium, carbon dioxide, methane Examples of liquids (at room temperature and pressure) – Water, milk,	Thermal conductivity – thermal conductor, thermal insulator Electrical conductivity – electrical conductor, electrical insulator Dissolving – Solvent, solution, solute, soluble, insoluble, solid, liquid, particles, suspensions Separating materials –	

				rocks – Hard/soft, permeable/impermeable Processes – Heat, pressure, erosion, transportation, deposition, melt, solidify Size of rocks – Grain, pebbles Rock Crystals, layers Early areas of land – Gondwana, Pangea Land formations – Plates, volcanoes, mountains, valleys	juice, petrol, oil Examples of solids (at room temperature and pressure) –Wood, rocks, metal, plastic, glass, wool, leather, etc Processes – Melting, condensation, evaporation, solidifying, freezing Water cycle Water vapour Steam Heating Cooling	Sieve, filter, evaporate, condense	
<b>Seasonal changes</b>		Seasons; spring, summer, autumn, winter Year, months, days Hot, warm, mild, cold Sunny Cloudy Rain, sleet, snow, hail, thunder, lightning, rainbow Wet, damp, dry Windy, breezy, Temperature	Degrees Celsius Thermometer Weather vane Anemometer Gust Storm Heat wave Frost hail				
<b>Light</b>				Simple comparisons: dark, dull, bright, very bright Comparative vocabulary: brighter, duller, and darker Superlative vocabulary: brightest, dulllest, and darkest Opaque, translucent, transparent Shadow – block, absence of light Reflect – bounce, mirror, reflection			Reflect – bounce, mirror, direction, travel, speed, reflection light source Sun – sunset, sunrise, position
<b>Electricity</b>					Electricity		Volts, (V)

					<p>Appliances: fridge, freezer, TV, computer, iron, kettle, etc</p> <p>Series circuit, current</p> <p>Components: battery, cell, bulb (lamp), bulb (lamp) holder, buzzer, crocodile clip, leads, wires, switch</p> <p>brighter, duller</p> <p>Conductor, insulator</p>		<p>slow, fast, quiet, loud</p> <p>Resistance</p>
<b>Forces and magnets</b>				<p>Magnets – bar and horseshoe</p> <p>Attract, repel North and south poles Magnetic, Magnetic field force</p>		<p>gravity, friction, air resistance, upthrust, weight</p> <p>Measuring forces: Newton meter, Newtons (N)</p> <p>Particles</p> <p>Surface area</p>	
<b>Sound</b>					<p>bang, blow, shake, and pluck</p> <p>Loudness – quiet, quieter, quietest, loud, louder and loudest</p> <p>Pitch - low, lower, lowest, high, higher, and highest</p> <p>Vibrations, Source ear</p>		
<b>Earth and space</b>						<p>Day and night - Earth, axis, rotate Solar system – Star = Sun, Planets = Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune (Pluto was classified as Dwarf planet in 2006) Phases of the Moon - full moon, gibbous moon, half moon, crescent moon, new moon, waxing</p>	

						,waning Moon's orbit: 29.5 days, lunar month Orbit, planets, revolve, sphere Universe Galaxy constellation	
<b>Evolution and inheritance</b>							Evolution, evolve • Natural selection • Survival Kent Scheme of Work for Primary Science, 2019. 4 • Reproduction • Offspring, parents, siblings • Environment • Variation • Fossils; ammonites, belemnites, micrasters, etc

