

Spread Your Wings. Learn New Things. Fly As High As You Can.

National Curriculum Science Programmes of Study and EYFS Framework			
Relevant Early Learning Goals			
Understanding the World: The Natural World			
<ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. 			
Little Doves	Nursery	Reception	
<ul style="list-style-type: none"> • I explore materials with different properties. • I explore natural materials indoors and outdoors. • I am able to explore and respond to the natural world in the Early Years Garden. 	<ul style="list-style-type: none"> • I explore collections of materials with similar and/or different properties and show understanding by talking about what I see using a wide vocabulary. • I talk about the differences between materials and the changes I notice. • I explore and talk about the forces that I can feel. • I use all senses in hands on exploration of natural materials. • I am beginning to understand I need to respect and care for the natural environment and living things. • I know how to plant seeds and care for growing plants. • I understand the key features of the life cycle of a plant and an animal. For example, the lifecycle of a butterfly. 	<ul style="list-style-type: none"> • I am able to describe what I see, hear, feel when outside. • I know how to explore the effect of changing seasons on the natural world around them. For example; weather, plants, animals etc. • I know how to talk about forces that I can feel. 	
Key Stage 1			
Working Scientifically	Biology	Chemistry	Physics
During Years 1 and 2, pupils should be taught to use the following practical scientific	<u>Living things and their habitats</u> <ul style="list-style-type: none"> • explore and compare the differences between things that 	<u>Everyday materials</u>	<u>Seasonal changes</u> <ul style="list-style-type: none"> • observe changes across the four seasons

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<p>methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions 	<p>are living, dead, and things that have never been alive</p> <p><u>Animals, including humans</u></p> <ul style="list-style-type: none"> • identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals 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 • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene <p><u>Plants</u></p> <ul style="list-style-type: none"> • identify and name a variety of common wild and garden plants 	<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 wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties • identify and 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 shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<ul style="list-style-type: none"> • observe and describe weather associated with the seasons and how day length varies.
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	<p>including deciduous and evergreen trees</p> <ul style="list-style-type: none"> • identify and describe the basic structure of a variety of common flowering plants, including trees. • 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. <p><u>Habitats</u></p> <ul style="list-style-type: none"> • 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. 		
Lower Key Stage 2			
Working Scientifically	Biology	Chemistry	Physics
During Years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> • recognise that living things can be grouped in a variety of ways 	<p><u>Rocks</u></p> <ul style="list-style-type: none"> •compare and group together different kinds of rocks on the 	<p><u>Electricity</u></p> <ul style="list-style-type: none"> •identify common appliances that run on electricity

<p>through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and , where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions · recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to 	<ul style="list-style-type: none"> • 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><u>Animals, including humans</u></p> <ul style="list-style-type: none"> • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other 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 humans and their simple functions. • Construct and interpret a variety of food chains, identifying producers, predators and prey <p><u>Plants</u></p> <ul style="list-style-type: none"> • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, 	<p>basis of their simple physical properties</p> <ul style="list-style-type: none"> • 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. <p><u>States of matter</u></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 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. 	<ul style="list-style-type: none"> •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 •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><u>Forces and magnets</u></p> <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 •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
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<p>simple scientific ideas and processes</p> <ul style="list-style-type: none"> • using straightforward scientific evidence to answer questions or to support their findings. 	<p>and room to grow) and how they vary from plant to plant</p> <ul style="list-style-type: none"> • investigate the way in which water is transported within plants • explore the part of flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 		<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><u>Light</u></p> <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 a light source is blocked by a solid object • find patterns in the way that the size of shadows change <p><u>Sound</u></p> <ul style="list-style-type: none"> • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sound travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it.
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			<ul style="list-style-type: none"> • recognise that sounds get fainter as the distance from the sound source increases.
Upper Key Stage 2			
Working Scientifically	Biology	Chemistry	Physics
<p>During Years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate · recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs, • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations results, explanations of and degree of trust in results, in oral and written 	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> • 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 animals based on specific characteristics • describe the life process of reproduction in some plants and animals · describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. <p><u>Animals, including humans</u></p> <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 	<p><u>Properties of everyday materials</u></p> <ul style="list-style-type: none"> • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic <p><u>Reversible change</u></p> <ul style="list-style-type: none"> • demonstrate that dissolving, mixing and changes of state are reversible changes. Changes that form new materials • explain that some changes result in the formation of new 	<p><u>Electricity</u></p> <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 <p><u>Forces</u></p> <ul style="list-style-type: none"> · explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effect of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect <p><u>Light</u></p>

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<p>forms such as displays and other presentations</p> <ul style="list-style-type: none"> • identifying scientific evidence that has been used to support or refute ideas or arguments. 	<ul style="list-style-type: none"> • 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 <p><u>Evolution and inheritance</u></p> <ul style="list-style-type: none"> • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • recognise that living things have changed over time and that fossils provide the information about living things that inhabited the Earth millions of years ago • identify how animals and plants are adapted to suit their environment in different ways and that adaption leads to evolution. 	<p>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>	<ul style="list-style-type: none"> • recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them <p><u>Earth and space</u></p> <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 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.
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Dovecotes Long Term Science Planning								
	Little Doves and Nursery	Reception	Year 1/2 Cycle A	Year 1/2 Cycle B	Y3/4 Cycle A	Y3/4 Cycle B	Y5/6 Cycle A	Y5/6 Cycle B
Autumn	EYFS teach through exploration and play through themes which are heavily led by the children's interests.		Everyday Materials	Weather (1) Plants (2)	Forces and Magnets (1) Animals and Skeletons (2)	Electricity (1) Light (2)	Classification (1) Humans (2)	Forces (1) Mixtures and Reactions (1)
Spring			Animal Kingdom (1) Plants (2)	Living Things	Rocks (1) Respecting the Environment (2)	Digestion (1) Animals Homes (2)	Electricity (1) Earth & Space (2)	Decay and Recycling (2) Classification (1)
Summer			Local Habitats (1) Animals and their needs (2)	Habitats	Plants (1) Classification (2)	States of Matter (1) Sound (2)	Fieldwork Studies (1) Hearts and Lungs (2)	Fieldwork Studies (1) – Y5 only Evolution (2)
Working Scientifically								
EYFS		Year 1 and Year 2			Year 3 and Year 4		Year 5 and Year 6	

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<ul style="list-style-type: none"> • Making predictions • Testing their ideas • Asking why things happen; having their own ideas. • Teacher led investigative experiences - Which is the strongest material to build a house? • Observing changes including life cycles and seasonal changes. • Observing and interacting with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water. 	<ul style="list-style-type: none"> • I can ask simple questions and recognise that they can be answered in different ways • I can observe closely, using simple equipment • I can perform simple tests • I can identify and classify a variety of objects • I can use my observations and ideas to suggest answers to questions • I can gather and record data to help me to answer questions 	<ul style="list-style-type: none"> • I can ask relevant questions and use different types of scientific enquiry to answer them • I can set up practical enquiries, comparative and fair tests • I can make systematic and careful observations, and, where appropriate, take accurate measurements in standard units using a range of equipment, including thermometers and data loggers • I can gather, record, classify and present data in a variety of ways to help answer questions • I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables • I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 	<ul style="list-style-type: none"> • I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • I can take measurements, using scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs line and bar graphs • I can use test results to make predictions to set up further comparative and fair tests • I can report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • I can identify scientific evidence that has been used to support or refute ideas or arguments
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Animals including Humans	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> To explore their local environments, talking about plants and animals that they see. (Look at different animals and their body parts. Talk about why they have them e.g. beak, wings, legs) To develop an awareness of own Personal hygiene such as going to the toilet, washing hands, brushing teeth. Investigating what lives under leaves and logs, minibeast hunts, life cycles (e.g a butterfly). 	<ul style="list-style-type: none"> I can identify and name a variety of common British animals that are birds, fish, amphibians, reptiles, mammals and invertebrates I can identify and name a variety of common animals that are carnivores, herbivores and omnivores I can describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets) I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense 	<ul style="list-style-type: none"> I know that animals, including humans, have offspring which grow into adults I can describe the basic needs of animals, including humans, for survival I can describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene
Year 3 & 4		Year 5 & 6	
<ul style="list-style-type: none"> I can identify that animals, including humans, need the right types of nutrition, and they cannot make their own food; they get nutrition from what they eat I can identify that humans and some animals have skeletons and muscles for support, protection and movement 	<ul style="list-style-type: none"> I can describe the simple functions of the basic parts of the digestive system in humans I can identify the different types of teeth in humans and describe their simple functions I can construct and interpret a variety of food chains, identifying producers, predators and prey 	<ul style="list-style-type: none"> I can describe the changes as humans develop from birth to old age in detail 	<ul style="list-style-type: none"> I can identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function I can describe the ways in which nutrients and water are

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			transported within animals, including humans
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Living Things and their habitats	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> • Talk about their pets. • Go on Minibeast hunts. • Learn about lifecycles when hatching Butterflies. • Visits to the school garden to see what living things are there. • Visits to a farm to experience different living things and their habitats. 		<ul style="list-style-type: none"> • I can explore and compare the differences between things that are living, dead and things that have never been alive • I can 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 • I can identify and name a variety of plants and animals in their habitats, including micro- habitats • I can 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
Year 3 & 4		Year 5 & 6	

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	<ul style="list-style-type: none"> • I can recognise that living things can be grouped in a variety of ways • I can explore and use classification keys to help group, identify and name a variety of living things in the local and wider environment • I can recognise that environments can change and that this can sometimes pose dangers to living things 	<ul style="list-style-type: none"> • I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • I can describe the life process of reproduction in some plants and animals 	<ul style="list-style-type: none"> • I can describe how living are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • I can give reasons for classifying plants and animals based on specific characteristics
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Plants	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> • Looking at conkers, pumpkins, vegetables and blackberries. • In the Cops, begin to name the trees, understanding why the trees change throughout the year and why some stay green. Being able to talk about the changes. • Growing vegetables, sunflowers and talking about what plants need to grow healthily. 	<ul style="list-style-type: none"> • I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • I can identify and describe the basic structure of a variety of common flowering plants, including trees 	<ul style="list-style-type: none"> • I can observe and describe how seeds and bulbs grow into mature plants • I can find out and describe how plants need water light and a suitable temperature to grow and stay healthy
	Year 3 & 4	Year 5 & 6	
<ul style="list-style-type: none"> • I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 			



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<ul style="list-style-type: none"> • I can 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 • I can investigate the way in which water is transported within plants <p>I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>			
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Seasonal Changes	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> • Experience the outside area throughout the year and will observe the changes over time. • Talk about the weather and how it changes and what to wear. Eg – Raining – wellington boots and coats/ Sun cream and hats. • During visits to the Cops, experience first-hand the seasonal changes throughout the year. • Learn the names of the different seasons and weather types. 	<ul style="list-style-type: none"> • I can observe changes across the four seasons I can observe and describe the weather associated with the seasons and how day length varies 	

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	<ul style="list-style-type: none"> Learn about being safe in the Sun. 		
Year 3 & 4		Year 5 & 6	

Materials	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> Participate in cooking activities to experiences how liquids and solids change when cold or heat is applied. Make choices over what properties of materials to use when junk modelling. During sensory play have the opportunities to squash and squeeze the different materials. Decide what materials to use when building outside using loose parts. Mud, Sand and Water play are available to provide children the opportunities to investigate the properties of materials when mixing together. Explore natural materials indoors and outdoors. 	<ul style="list-style-type: none"> I can distinguish between an object and the material from which it is made I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock I can describe simple physical properties of a variety of everyday materials I can compare and group together a variety of everyday materials on the basis of their simple physical properties 	<ul style="list-style-type: none"> I can identify and compare the suitability of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
Year 3 & 4		Year 5 & 6	
		<ul style="list-style-type: none"> I can group together everyday materials based on evidence from comparative 	

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		<p>and fair tests, including their hardness, solubility, transparency, conductivity and response to magnets</p> <ul style="list-style-type: none">• I know that some materials will dissolve in liquid to form a solution and can describe how to recover a substance from a solution• I can use knowledge of solids, liquids and gases to decide how mixtures might be separated including through filtering, sieving and evaporating• I can give reasons based on evidence from comparative and fair tests for the particular uses of everyday materials including metals, woods and plastics• I can demonstrate that dissolving, mixing and changes of state are reversible changes• I can 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	
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Rocks	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> Encourage children's fascination with the natural world using sets of mixed rocks for sand and small world play. 		
Year 3 & 4		Year 5 & 6	
<ul style="list-style-type: none"> I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties I can describe how fossils are formed when things that have lived are trapped within rocks I can recognise that soils are made from rocks and organic matter. 			

Light	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> Observing and interacting with natural processes, such as light travelling through transparent material, an object casting a shadow. 		
Year 3 & 4		Year 5 & 6	
<ul style="list-style-type: none"> I can recognise that I need light in order to see things and that dark is the absence of light 			<ul style="list-style-type: none"> I can recognise that light appears to travel in straight lines I can use the idea that light

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<ul style="list-style-type: none"> • I can notice light is reflected from surfaces • I can recognise that light from the sun can be dangerous and that there are ways to protect my eyes • I can recognise that shadows are formed when the light from a light source is blocked by an opaque object I can find patterns in the way that the size of shadows change 			<p>travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p> <ul style="list-style-type: none"> • I explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
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Forces and magnets	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> • I explore and talk about the forces that I can feel. • Observing and interacting with natural processes, such as a magnet attracting an object and a boat floating on water. 		
Year 3 & 4		Year 5 & 6	
<ul style="list-style-type: none"> • I can compare how things move on different surfaces • I can notice that some forces need contact between two objects, but magnetic forces can act at a distance • I can observe how magnets attract or repel each other 		<ul style="list-style-type: none"> • I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • I can identify the effects of air resistance, water resistance and friction that 	



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<p>and attract some materials and not others</p> <ul style="list-style-type: none"> I can 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 I can describe magnets as having two poles I can predict whether two magnets will attract or repel each other, depending on which poles are facing 		<p>act between moving surfaces</p> <ul style="list-style-type: none"> I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect 	
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Sound	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> Observing and interacting with natural processes, such as sound causing a vibration. 		
Year 3 & 4		Year 5 & 6	
	<ul style="list-style-type: none"> I can identify how sounds are made, associating some of them with something vibrating I can recognise that vibrations from sounds travel through a medium to the ear I can find patterns between the pitch of a sound and 		

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	<p>features of the object that produced it</p> <ul style="list-style-type: none"> • I can find patterns between the volume of a sound and the strength of the vibrations that produced it • I can recognise that sounds get fainter as the distance from the sound source increases 		
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States of Matter	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> • Observing and interacting with natural processes, such as ice melting. 		
Year 3 & 4		Year 5 & 6	
	<ul style="list-style-type: none"> • I can compare and group materials together according to whether they are solids, liquids or gases • I can observe that some materials look different or appear to disappear when they are heated or cooled and measure or research the temperature at which this happens in degrees Celsius • I can identify the part played by evaporation and condensation in the water cycle and associate the rate 		



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	of evaporation with temperature		
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Earth and Space	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> Introduce Space by reading stories like 'Aliens Love Underpants' 		
Year 3 & 4		Year 5 & 6	
		<ul style="list-style-type: none"> I can describe the movement of the Earth and other planets in relation to the sun in the solar system I can describe the movement of the moon in relation to the Earth I can describe the sun, Earth and moon as approximately spherical bodies I can use the idea of Earth's rotation to explain day and night and the apparent movement of the sun across the sky 	

Electricity	EYFS	Year 1	Year 2
	<ul style="list-style-type: none"> Learn about electrical safety. 		
Year 3 & 4		Year 5 & 6	
	<ul style="list-style-type: none"> I can identify common appliance that run on electricity 		<ul style="list-style-type: none"> I can associate the brightness of a lamp or volume of a buzzer with the

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	<ul style="list-style-type: none"> • I can construct a simple series circuit and name its basic parts including cells, wires, bulbs, switches and buzzers • I can 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 • I can recognise that switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • I can recognise some common conductors and insulators and associate metals with being good conductors 		<p>number and voltage of cells used in the circuit</p> <ul style="list-style-type: none"> • I can compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness or buzzers and the on/off position of switches • I can use the recognised symbols when representing a simple circuit in a diagram
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Evolution and Inheritance	EYFS	Year 1	Year 2
Year 3 & 4		Year 5 & 6	
			<ul style="list-style-type: none"> • I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago



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			<ul style="list-style-type: none"> • I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
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Dovecotes Primary School Substantive Knowledge			
Year 1			
Animals Including Humans			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
names of a variety of common animals including fish, amphibians, reptiles, birds and mammals.	<ul style="list-style-type: none"> • Names of common animal groups (fish, amphibians, reptiles, birds, insects, arachnids and mammals) • Names of individual common animals, native and otherwise (eg Native - dog, cat, horse, cow, chicken, frog, fly, goldfish, spider. Non-native – monkey, snake, elephant, lion, bear) • Humans are animals - mammals 	<ul style="list-style-type: none"> • humans are not animals • spiders are insects 	humans fish, amphibians, reptiles, birds, insects, arachnids and mammals, pets, native, non-native.
names of a variety of common animals that are carnivores, herbivores and omnivores	<ul style="list-style-type: none"> • Can explain the meaning of carnivore, herbivore and omnivore. • Names examples of carnivores (eg wolf, cat, lion) 	<ul style="list-style-type: none"> • Whales/dolphins are fish (They are mammals) • dogs/bears/foxes are carnivores 	herbivore, carnivore, omnivore, examples of each

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	<ul style="list-style-type: none"> Names examples of herbivores (eg chicken, rabbit, snail) Names examples of omnivores (eg human, fox, bears) 	<ul style="list-style-type: none"> Anything with sharp teeth must be a carnivore. Vegetarians or vegans are herbivores (this is a choice, not a biological truth) 	
structure of a variety of common animals.	<ul style="list-style-type: none"> Most common animals have a skeleton. Generally, adult animals have 0, 2, 4, 6 or 8 limbs Insects have a head, thorax abdomen 	<ul style="list-style-type: none"> all animals have a skeleton (jellyfish) Fish don't have a skeleton. All animals have legs (snake, worm) humans/monkeys have 2 limbs – discuss difference between legs and limbs 	skeleton, head, limbs, arms, legs, fins, gills, wings, tail, thorax, abdomen
basic parts of the human body and which part of the body is associated with each sense.	<ul style="list-style-type: none"> Name a variety of main body parts (head, shoulders, chest, arms, legs, “belly”-stomach, feet, hands, knee, elbow, bottom, back) Sight = eyes, Hearing = ears, Smell = nose, Taste = tongue, Touch = skin 	<ul style="list-style-type: none"> You use your hands to touch – any part of your skin can sense touch. You use your mouth to taste – only the tongue has taste buds. 	head, shoulders, torso, chest, limbs, arms, legs, feet, hands, knee, elbow, “belly”-stomach, bottom, back. sense; taste - tongue, mouth; sight - eyes; hearing - ears, sound; touch - fingers, skin, nerves; smell - nose;
Everyday Materials			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
there is a difference between an object and the material from which it is made.	<ul style="list-style-type: none"> object = item or thing, material= what the thing is made from. 	<ul style="list-style-type: none"> Material is “what clothes are made from.” “Material” is the name of a material – “This is made of material.” 	object, material, made
names of a variety of everyday materials.	<ul style="list-style-type: none"> Be able to name wood, plastic, glass, metal, cotton, brick, water, and rock as materials. 	<ul style="list-style-type: none"> All metals are the same All rocks are the same 	wood, plastic, glass, metal, cotton, brick, water, and rock

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simple physical properties of a variety of everyday materials.	<ul style="list-style-type: none"> Be able to describe given materials and give general statements about materials "Cotton is soft." 	<ul style="list-style-type: none"> All metals are hard/rigid All rocks are hard All wood is hard/rigid Rigid, strong and hard are the same thing (rigid – doesn't bend, strong – is able to withstand force/pressure without changing shape, hard – not easy to break) soft is the same as smooth. 	property, rough, smooth, hard, soft, strong, weak, rigid, flexible
compare and group together a variety of everyday materials on the basis of their simple physical properties	<ul style="list-style-type: none"> Be able to group a variety of materials based on physical properties – "The rock and the metal are together because they are hard." 	<ul style="list-style-type: none"> as previous 	property, rough, smooth, hard, soft, strong, weak, rigid, flexible
Plants			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
names of a variety of common wild and garden plants, including deciduous and evergreen trees.	<ul style="list-style-type: none"> Name common flowering plants (daisy, sunflower, tulip, rose, pansy) Name common plant types (tree, bush, flowering plant, grass) 	<ul style="list-style-type: none"> All trees lose leaves in Autumn. A leaf is a type of plant in itself. 	plant, flower, deciduous, evergreen
basic structure of a variety of common flowering plants, including trees.	<ul style="list-style-type: none"> Recognise the general structure of a flowering plant (roots, stem, leaves, flowers) Recognise the general structure of a tree (roots, trunk, branches, leaves, flowers – for some) 	<ul style="list-style-type: none"> All trees lose leaves in Autumn. A flower is the whole plant. 	stem, trunk, leaf, branch, flower
Seasonal Changes			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
changes across the four seasons	<ul style="list-style-type: none"> Months in each season. 	<ul style="list-style-type: none"> All plants lose their leaves in Autumn/Winter – not true. 	names of all 12 months, change, season, Spring, Summer,

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	<ul style="list-style-type: none"> • Temperature changes across the seasons (link to EYFS learning) • Leaves fall off deciduous trees in Autumn. • New life in Spring (plants and animals) • Changes in appropriate clothing • Important days in each season (Christmas, Easter, Bonfire Night, Midsummer, Midwinter) 	<ul style="list-style-type: none"> • No flowering plants can survive in Winter (snowdrops, pansies) 	Autumn, Winter, deciduous, evergreen
weather associated with the seasons and how day length varies.	<ul style="list-style-type: none"> • As we move from Winter to Summer, days get longer and nights get shorter; weather becomes warmer. • As we move from Summer to Winter, days get shorter and nights get longer; weather becomes colder. • Seasons are linked to the Earth moving around the Sun. 	<ul style="list-style-type: none"> • Seasons are linked to the Earth turning around/spinning. 	weather, colder, warmer, hotter, snow, rain, sun, temperature, day, night, longer, shorter, light, Earth, Sun,

Year 2			
Animals Including Humans			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
animals, including humans, have offspring which grow into adults.	<ul style="list-style-type: none"> • Understand animals reproduce • Live birth (mammals) • Many animals lay eggs (birds, fish, reptiles, amphibians, insects, arachnids) 	<ul style="list-style-type: none"> • Humans aren't animals (revisit this misconception from previous year) • mammals don't have eggs at all – all internal. 	offspring, young, adult, names of young (baby, child, lamb, piglet, puppy, kitten, foal, calf, chick, snakelet, spiderling, larvae)

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	<ul style="list-style-type: none"> Names of common young (baby, child, lamb, piglet, puppy, kitten, foal, calf, chick, snakelet, spiderling, larvae) 	<ul style="list-style-type: none"> All animal young are like small adults (insect larvae, tadpoles) 	
basic needs of animals, including humans, for survival (water, food and air)	<ul style="list-style-type: none"> Animals need oxygen to survive. Animals need water and food to survive. 	<ul style="list-style-type: none"> Fish don't need air – they take it in through their gills. Aquatic mammals (dolphins, whales) must come to the surface to breathe – hence the blowholes. Fish etc don't drink water because they live in it. 	survival, water, drink, nutrition, food, eat, air, breathe, needs, aquatic
importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	<ul style="list-style-type: none"> Understand exercise is important to be healthy Understand a balanced diet is important to be healthy Understand sleep is important to be healthy Understand good hygiene (washing hands before food/drink, brushing teeth, cleaning self regularly, avoiding spread of germs) is important to be healthy 	<ul style="list-style-type: none"> Eating only fruit and veg is a healthy diet. You can eat lots of unhealthy food as long as you have some veg as well. Sleep doesn't affect your health. You only need to wash your hands before you eat. "Diet" means being "on a diet" 	hygiene, nutrition, exercise, food, wash, clean, brush, sleep, healthy, unhealthy, disease, illness, weight, germs, balanced diet (fruit, veg, meat, protein, carbohydrates, fats, dairy – Plus examples of these)
Living Things and their Habitats			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
differences between things that are living, dead, and things that have never been alive.	<ul style="list-style-type: none"> Recognise the features of living things (MRS GREN – Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion, Nutrition) Identify that a dead plant or animal used to be alive. 	<ul style="list-style-type: none"> Rocks etc are "dead" because they aren't alive. Plants don't move – plants can move towards the sun (show time-lapse video) 	living, dead, never lived, movement, respiration, sensitivity, nutrition, excretion, reproduction, growth

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	Recognise things which have never been alive.		
names of a variety of plants and animals in their habitats, including micro-habitats.	<ul style="list-style-type: none"> • Understand the difference between a habitat and micro-habitat. • Identify a variety of plants and animals which live in given habitats. • Identify a variety of plants and animals which live in given micro-habitats. 	<ul style="list-style-type: none"> • A habitat refers to where animals live, not plants. • A plant can't be a habitat (a tree/bush is also an example of a micro-habitat) 	plants, animals, habitats, micro-habitats
most living things live in habitats to which they are suited and different habitats provide for the basic needs of different kinds of animals and plants, and they depend on each other.	<ul style="list-style-type: none"> • Identify a variety of habitats (forest, grassland, desert etc) • Identify a variety of plants and animals which live in given habitats. • Recognise ways in which animals/plants are suited to their habitats (frogs are good swimmers, camels store fat, monkeys have feet they can use to climb) 	<ul style="list-style-type: none"> • a desert is hot (Note – no rain; Antarctic also desert), • Camels store water – actually fat 	habitat, suitability, adapted
how animals obtain their food from plants and other animals, using the idea of a simple food chain, and different sources of food.	<ul style="list-style-type: none"> • A producer starts every food chain. It is always a plant. • All animals are consumers. • Animals which eat other animals are predators. Animals eaten by other animals are prey. • An animal can be both predator and prey (eg fox) • An animal with no predators is an apex predator. 	<ul style="list-style-type: none"> • Arrows show what the animal eats. • Plants can't be consumers (Venus fly trap) • An animal is either predator or prey but not both. 	food chain, food source, predator, prey, producer, consumer, apex predator

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	<ul style="list-style-type: none"> The arrows in a food chain show “is eaten by”. Identify/create a food chain with at least three links. 		
Plants			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
how seeds and bulbs grow into mature plants.	<ul style="list-style-type: none"> Show the stages of growth of a typical plant (seed, germination, roots, seedling, stem, leaves, flower, seed dispersal) 	<ul style="list-style-type: none"> all flowers grow from seeds. The plant grows up first, then roots. 	seed, bulb, germination, roots, seedling, stem, leaves, mature, flower, seed dispersal
plants need water, light and a suitable temperature to grow and stay healthy.	<ul style="list-style-type: none"> Identify plants need water, light and a suitable temperature to grow and stay healthy. 	<ul style="list-style-type: none"> Temperature doesn’t matter. Plants need soil to grow. Plants won’t grow at all without light. Plants can grow with no water. 	suitable temperature, water, light, grow, soil, healthy
Everyday Materials and Their Uses			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
suitability of a variety of everyday materials for particular uses.	<ul style="list-style-type: none"> identify what materials certain items are made from. Explain why items are made from given materials – eg. walls made of bricks as they are strong, hard, heavy etc. Explain why certain materials would be unsuitable for given items – eg teapot made of 	<ul style="list-style-type: none"> Mix up items/materials/properties 	suitable, unsuitable, wood, metal, plastic, glass, brick, rock, paper, cardboard

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	chocolate unsuitable because the chocolate would melt.		
shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	<ul style="list-style-type: none"> Solids do not change shape on their own. A force must be applied to change the shape of a solid. Solids can be squashed, bent, twisted or stretched. Different solids may take a different amount of force to change shape. 	<ul style="list-style-type: none"> solids can change shape on their own If we can't apply enough force it can't be done (eg iron bar – we couldn't bend it but a machine could). 	squashing, bending, twisting and stretching.

Year 3 & 4			
Magnets and Forces			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
things move differently on different surfaces.	<ul style="list-style-type: none"> Recognise that items move differently on different surfaces. Understand the concept of friction. Recognise friction as a pulling force – pulls against movement. Predict how an item will move on a given surface eg. ice/ gravel. Recognise friction can create heat. 	<ul style="list-style-type: none"> Friction can make things go faster – lack of friction. 	movement, friction, surface, pull, heat
some forces need contact between two objects, but magnetic forces can act at a distance.	<ul style="list-style-type: none"> Know forces as a push or pull. Recognise that most forces are a push or pull between two objects through contact. 	<ul style="list-style-type: none"> All forces are a push. All forces need contact. 	force, contact, magnetic, push, pull, distance

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	<ul style="list-style-type: none"> Recognise magnetism acts at a distance. 		
magnets have two poles.	<ul style="list-style-type: none"> Magnets have two poles – North and South. 	<ul style="list-style-type: none"> All forces are a push. All forces need contact. 	magnet, pole, North, South
two magnets will attract or repel each other, depending on which poles are facing.	<ul style="list-style-type: none"> Magnets can attract and repel. Like poles (S/S, N/N) repel Opposite poles (S/N) attract. 	<ul style="list-style-type: none"> Like poles attract. Definition of repel – some children think if it doesn't attract something (eg wood) it repels it – not true, it just has no effect. 	magnet, pole, North, South, like poles, opposite poles, attract, repel, metal, magnetic
some materials are attracted by magnets and others are not.	<ul style="list-style-type: none"> Magnets can attract materials or have no effect on them. Magnets only attract metals. Magnets do not attract all metals. Identify whether a material is magnetic or not. 	<ul style="list-style-type: none"> Magnets attract all metals. Definition of repel – some children think if it doesn't attract something (eg wood) it repels it – not true, it just has no effect. 	magnetic, attract, metal
Rocks			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
different kinds of rocks can be grouped together on the basis of their appearance and simple physical properties.	<ul style="list-style-type: none"> Recognise not all rocks are the same. Recognise rocks look different. Recognise rocks can have different properties. 	<ul style="list-style-type: none"> All rocks are hard. All rocks are heavy. 	rock, hardness, metamorphic, igneous, sedimentary, density
fossils are formed when things that have lived are trapped within rock	<ul style="list-style-type: none"> Fossils are caused by dead animals/plants. Dead matter is trapped within rock and compressed over thousands/millions of years. Dead matter rots/decays and the imprint is left behind. 	<ul style="list-style-type: none"> Fossils are always the actual remains of the living thing. 	fossil, fossilisation, dead, rot, decay, cast

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	<ul style="list-style-type: none"> Fossil casts can be created by pouring plaster into the space left by dead matter. 		
soils are made from rocks and organic matter.	<ul style="list-style-type: none"> Soil is made from broken down rock & organic matter. Soil is formed over time. 	<ul style="list-style-type: none"> Soil is something completely different to rock/organic matter. "It's just dirt." 	soil, rock, organic matter
Animals Including Humans			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.	<ul style="list-style-type: none"> Animals, including humans, get nutrition from what we eat. Animals cannot make their own food. We need the right type of nutrition (carnivores, herbivores, omnivores) Omnivores (eg humans) need a balanced diet. 	<ul style="list-style-type: none"> Humans "make" their own food – this means create food within the body, not the way we make a sandwich etc. 	food, nutrition, eat, carnivore, herbivore, omnivore, balanced diet
humans and some other animals have skeletons and muscles for support, protection and movement.	<ul style="list-style-type: none"> Humans and some other animals have skeletons. Difference between vertebrates and invertebrates. Endoskeletons are inside the body (with examples eg humans) Exoskeletons are outside the body (with examples eg tortoise) Skeletons and muscles support the body – keep it in shape. Skeletons and muscles protect the organs – know 	<ul style="list-style-type: none"> All animals have skeletons. Skeletons are always inside the body. Skeletons can move without help. Muscles can push or pull – they only pull but work in pairs. some misconceptions about where organs are in the body. 	skeleton, vertebrate, invertebrate, endoskeleton, exoskeleton, spine, support, shape, protect, internal, organs, stomach, heart, lungs, brain, ribs, pelvis, skull, muscle, movement, pull, ligament, tendon,

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	<p>which, eg ribs protect heart and lungs.</p> <ul style="list-style-type: none"> • Skeletons and muscles are used in movement – note: learn about how muscles pull the bones and work in pairs. 		
<p>simple functions of the basic parts of the digestive system in humans.</p>	<ul style="list-style-type: none"> • Parts of the digestive system – mouth, oesophagus, liver, stomach, pancreas, small intestine, large intestine, rectum, anus • Basic understanding of the job of each part. • mouth – teeth break down food and mix with enzymes in saliva. • oesophagus – thin tube connecting mouth to stomach. • liver – releases bile into intestines. Bile breaks down lipids. • stomach – muscular bag mixes food and drink with acid. • pancreas – releases enzymes into the intestines, which break down carbohydrate, proteins and lipids. • small intestine – proteins, carbohydrate, and lipids 	<ul style="list-style-type: none"> • nutrients only pass into the blood from the stomach. • no food is digested in the mouth. 	<p><i>digestive system, oesophagus, stomach, liver, bile small intestine, lipids, carbohydrates, nutrients, proteins, large intestine, rectum, anus, faeces, fibre</i></p>

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	<p>digest. Nutrients absorbed into the blood.</p> <ul style="list-style-type: none"> • Large intestine – food which can't be broken down (mainly fibre) passes into here. Water absorbed into the blood. 		
different types of teeth in humans and their simple functions.	<ul style="list-style-type: none"> • There are different types of teeth in the mouth with different jobs. • Teeth have an enamel coat which is hard and strong. • Incisors – bite off and chew food. • Canines – for ripping and tearing food • Molars – for crushing and grinding food. 	<ul style="list-style-type: none"> • Teeth are all the same. 	<i>teeth, incisor, canine, molar, jaw, enamel</i>
variety of food chains, identifying producers, predators and prey.	<ul style="list-style-type: none"> • How to build a food chain. • Arrows show "eaten by" or transfer of energy. • producers are plants – they produce their own food. • prey is the name for animals which are eaten by others. • predators are animals which eat other animals. • an animal can be both predator and prey – eg a fox. • an apex predator is a predator which is not eaten by any other animals. 	<ul style="list-style-type: none"> • the arrows show what something eats. • animals can only be predator or prey. 	<i>producer, predator, prey, apex predator, food chain</i>

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Plants			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
functions of different parts of flowering plants.	<ul style="list-style-type: none"> Identify: roots, stem, leaves, flower, petals. Name the functions of roots (anchor & nutrition), stem/trunk (support and water transportation), leaves (photosynthesis), flower, petals 	<ul style="list-style-type: none"> The flower is to look pretty for people. 	roots, stem/trunk, leaves, flowers, petals, support, anchor, nutrition, water, transportation, attract, reproduction
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.	<ul style="list-style-type: none"> Basic needs – air, light, water, nutrients, room Most common plants need all of these. Identify examples of plants which have different requirements (cactus less need for water, orchids don't really need soil, air plants grow on other plants and not in the ground) Plants are limited by the amount of room they have – discuss repotting plants to allow larger growth. 	<ul style="list-style-type: none"> All plants need all of the named requirements, all of the time. Plants can grow to the same size, wherever they are planted. 	requirements, healthy, air, light, water, nutrients, soil, room, growth, limited, orchid, cactus, air plant
how water is transported within plants.	<ul style="list-style-type: none"> Water is taken into plants by the root. Water is transported up the stem to the rest of the plant. Some water evaporates from the leaves. 	<ul style="list-style-type: none"> The stem is only for support "It just holds up the plant" The roots are only to anchor the plant. A plant uses all of the water it takes in. 	stem, roots, nutrition, water, absorb, transport, evaporate

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<p>what part flowers play in the life cycle of flowering plants,</p>	<ul style="list-style-type: none"> • Recognise the flower is linked to reproduction in plants. • Plants produce seeds to reproduce. • Name and explain function of parts of flower (petal – attract, stamen (filament/anther) – male: pollen, carpel (ovary, style, stigma) – female: receive pollen. • Pollination – insects and birds going to different flowers carry pollen and fertilise the other. • Some flowers can self-pollinate (peanut, orchid, peas, sunflowers). • Seed dispersal – wind, animals, water, explosion 	<ul style="list-style-type: none"> • seeds grow near the parent plant. 	<p>stamen, filament, anther, pollen, carpel, ovary, style, stigma pollination, seed formation and seed dispersal, wind, water, explosion, animal.</p>
Light			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
<p>we need light in order to see things and that dark is the absence of light.</p>	<ul style="list-style-type: none"> • Light is created by a light source. • Light is required to see. • Darkness is the absence of light. 	<ul style="list-style-type: none"> • Darkness is a “thing” as opposed to the absence of light. • The moon is a light source. • Reflective surfaces (eg high-vis) are light sources. 	<p>light source, darkness, light, sight</p>
<p>light is reflected from surfaces.</p>	<ul style="list-style-type: none"> • Light is reflected off surfaces. We see when the light is reflected into our eyes. 	<ul style="list-style-type: none"> • The moon is a light source. • Reflective surfaces (eg high-vis jackets) are light sources. • “Reflective surface” means mirror. 	<p>reflect, reflective, surface, eyes</p>

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light from the sun can be dangerous and that there are ways to protect their eyes.	<ul style="list-style-type: none"> The Sun is a light source. The Sun is so bright it can harm our eyes. Other bright lights can harm our eyes. We can protect our eyes (sunglasses, shade, coloured lenses). 	<ul style="list-style-type: none"> If you look directly at the sun for even a second you will go immediately blind. You can only harm your eyes by looking directly at the sun (reflection in highly reflective surfaces can also harm, as can other light sources) If you wear sunglasses you can stare directly at the sun for as long as you want. Wearing sun cream will protect your eyes. 	rays, harm, sun, light, bright, protection, blindness, danger
shadows are formed when the light from a light source is blocked by an opaque object.	<ul style="list-style-type: none"> Shadows are formed when light is blocked. Shadows can change size and shape. 	<ul style="list-style-type: none"> You can run away from your shadow. Transparent objects can't have a shadow (eg glass windows – they do cast a very, very pale shadow) 	light source, shadow, block, opaque, transparent
there are patterns in the way that the size of shadows change.	<ul style="list-style-type: none"> Shadows can change size and shape. The closer the light source to the object, the bigger the shadow, and vice versa. The angle of the light source to the object will change the shape of a shadow. 	<ul style="list-style-type: none"> Shadows are always the same size. Shadows are always the same shape. Only big things can have big shadows. 	light source, shadow, block, opaque, shape, size, distance, angle
States of Matter			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
materials can be grouped together, according to whether they are solids, liquids or gases.	<ul style="list-style-type: none"> All materials are solid, liquid or gas. Solids have a rigid particle structure, with particles 	<ul style="list-style-type: none"> salt etc are not solid because they can be poured. 	<i>solid, liquid, gas, particle structure, rigid, fluid, expand, pour.</i>

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	<p>packed close together. A solid cannot be poured.</p> <ul style="list-style-type: none"> Liquids have a fluid particle structure with particles further apart which will fill a container from the bottom. Liquids can be poured. Gases have a very fluid particle structure with particles which expand to fill a container. Gases can be poured but will expand into the space. 		
<p>some materials change state when they are heated or cooled, at different temperatures in degrees Celsius (°C)</p>	<ul style="list-style-type: none"> Adding or reducing heat can change the state of an object. solids can be melted into liquid. liquids evaporate into gas gas condenses into liquid. liquid freezes into a solid. Different materials change state at different temperatures. 	<ul style="list-style-type: none"> All materials have the same freezing/ boiling points. All materials change state this way (eg wood burns, doesn't melt.) 	<p><i>change state, heat, cool, temperature, degrees Celsius</i></p>
<p>evaporation and condensation plays a part in the water cycle and the rate of evaporation is affected by temperature.</p>	<ul style="list-style-type: none"> water on Earth is all part of the water cycle. evaporation cause water to become gas and rise into the air. condensation creates clouds. When the clouds are heavy enough, the water falls as rain. 	<ul style="list-style-type: none"> clouds aren't made from water. rain is different to the water in streams/ seas. water evaporates at the same speed whatever the temperature. Water only evaporates when the weather is 100°C 	<p><i>evaporation, condensation, water cycle, temperature</i></p>

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	<ul style="list-style-type: none"> When the temperature is warmer, water evaporates faster. 		
Sounds			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
how sounds are made, associated with something vibrating.	<ul style="list-style-type: none"> Sound is caused by vibration 	<ul style="list-style-type: none"> Sound is caused by impact 	<i>sound, vibration.</i>
vibrations from sounds travel through a medium to the ear,	<ul style="list-style-type: none"> Sound travels via vibration. Sound can travel through gas, liquid or solid media. 	<ul style="list-style-type: none"> Sound only travels through air. 	<i>vibration, medium, ear, solid, liquid, gas</i>
there are patterns between the pitch of a sound and features of the object that produced it.	<ul style="list-style-type: none"> Pitch (high/low) is determined by the speed of the vibrations. Pitch is affected by the features of the vibrating object. 	<ul style="list-style-type: none"> Pitch/volume mixed up. 	<i>pitch, high, low, vibration</i>
there are patterns between the volume of a sound and the strength of the vibrations that produced it.	<ul style="list-style-type: none"> Volume (loud/quiet) is determined by the strength of the vibrations. Louder sounds are created by stronger vibrations. 	<ul style="list-style-type: none"> Pitch/volume mixed up. 	<i>volume, loud, quiet vibration, strength</i>
sounds get fainter as the distance from the sound source increases.	<ul style="list-style-type: none"> Sound dissipates over distance. Sound gets fainter as it moves further from its source. 	<ul style="list-style-type: none"> Sound is as fast as light. 	<i>faint, vibrations, distance, wave</i>
Living Things & their Habitats			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
living things can be grouped in a variety of ways.	<ul style="list-style-type: none"> Living things have characteristics by which they can be grouped. 	<ul style="list-style-type: none"> spiders are insects. 	<i>reptile, mammal, amphibian, bird, fish, insect, arachnid, plant</i>

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	<ul style="list-style-type: none"> Identify some characteristic of each of main living thing types. Main types of living thing are: reptile, mammal, amphibian, bird, fish, insect, arachnid, plant 		
classification keys can help group, identify and names of a variety of living things in their local and wider environment	<ul style="list-style-type: none"> We would use a classification key when we see an animals which we are unsure of. 	<ul style="list-style-type: none"> Classification keys are the only way to classify animals. 	classification key, environment, suited, identify
environments can change and that this can sometimes pose dangers to living things.	<ul style="list-style-type: none"> Environments can change. Humans can affect the environment. Environment changes can affect plants and animals living there. Environment change can be dangerous for living things. 	<ul style="list-style-type: none"> Only humans can cause environment change. Littering is harmless because it's "only one piece". 	environment, climate, adapt, danger
Electricity			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
names of common appliances that run on electricity.	<ul style="list-style-type: none"> Name a variety of common appliances using electricity (kettle, microwave, clock, shower, toaster etc) 	<ul style="list-style-type: none"> some appliances children may not realise use electricity – eg showers 	electricity, plug, wire, battery
names of basic parts of simple circuits.	<ul style="list-style-type: none"> A circuit is a path for electricity. A component is a part of a circuit. A cell is the power source. a battery is more than one cell together. wires connect components. 	<ul style="list-style-type: none"> a cell is a battery. 	circuit, cell, battery, wires, bulb, switch, buzzers and motors.

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	<ul style="list-style-type: none"> • bulb is a component that gives out light. • buzzer is a component which gives out sound. • A motor is a component which produces movement. • A switch is a component which can make or break a circuit. 		
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.	<ul style="list-style-type: none"> • identify a circuit must be a complete loop with a cell/battery to work. 	<ul style="list-style-type: none"> • a bulb will light as long as both sides of the bulb are connected. 	complete, incomplete, loop, battery, bulb
a switch opens and closes a circuit and determines whether or not a lamp lights in a simple series circuit.	<ul style="list-style-type: none"> • A switch can be open or closed. • An open switch breaks the circuit. • A closed switch completes the surface. • open: off – closed: on 	<ul style="list-style-type: none"> • closed = off. 	series circuit, switch, break, open, closed
some common conductors and insulators, and metals are good conductors.	<ul style="list-style-type: none"> • a conductor is a material electricity can travel through. • an insulator is a material electricity can't travel through. • Identify some conductors (metal, graphite etc) • Metals are particularly good conductors, which is why wires are made from metal. • Identify some insulators (wood, plastic etc) 	<ul style="list-style-type: none"> • electricity can travel through anything. • electricity can only travel through metal. 	conductor, insulator, metal

Year 5 & 6			
Animals including Humans			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
changes as humans develop to old age.	<ul style="list-style-type: none"> Baby – toddler – child – teenager – adult – old age Babies feed only on milk and then smooth food. Toddlers begin to eat solid food. Children go through puberty as they move into teenage years. Puberty also means both sexes produce lots of hormones which can affect mood and behaviour. As we reach old age, our bodies don't work as well. We become more vulnerable to disease and injury. Some people may shrink in old age. 	<ul style="list-style-type: none"> All people reach old age. babies can eat food. We get bigger as we get older (note – stay at full adult height until old age shrinkage). It is possible to live forever if you don't get ill. 	baby, toddler, child, teenager, adult, elderly, puberty, hormones
names of the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	<ul style="list-style-type: none"> heart is a pump. It is made up of 4 chambers (ventricles and atria) Arteries carry oxygenated blood from the heart to the muscles and organs. Veins carry deoxygenated blood back from the muscles and organs to the heart. Capillaries are tiny vessels which cover a large area of muscles and organs to allow 	<ul style="list-style-type: none"> Blood is blue when it is deoxygenated – not true: blood is always red (it is a deeper, darker red when deoxygenated and hence looks bluer on skin surface) 	heart, lungs, artery, vein, capillary, blood, red cell, white cell, oxygen, ventricle, atrium

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	<p>oxygen to easily diffuse from the blood to where it is needed.</p> <ul style="list-style-type: none"> • Blood contains red blood cells, white blood cells, plasma and platelets. • Red blood cells carry oxygen around the body • White blood cells work to fight disease and illness • Plasma is made up of water and protein and carries the blood cells and platelets around the body. • Platelets help to stop bleeding when you are cut. 		
<p>impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p>	<ul style="list-style-type: none"> • Diet is the most important factor in weight. • A healthy, balanced diet will ensure your body is at its most efficient. • Short term effects of exercise: increased heart rate, stronger pumps, increased breathing speed and depth, increased heat, sweat. • Long term effects of exercise: slower, more efficient heart, larger heart, greater lung capacity, more efficient lungs, muscle growth, mental health benefits. 	<ul style="list-style-type: none"> • Exercise means immediate growth – stress long term benefits • Lots of exercise means being huge and muscular – develop understanding of “fitness” over muscle. • Exercise is more important than diet when it comes to weight. 	<p>diet, exercise, drug, weight, addiction, illness, fitness, health</p>

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	<ul style="list-style-type: none"> • Effects of drugs on body – look at alcohol, general illegal drugs • Effect of lifestyle – look at smoking, drinking, laziness, overeating compared to healthy lifestyle. 		
ways in which nutrients and water are transported within animals, including humans.	<ul style="list-style-type: none"> • Nutrients and water are transported via the blood. • Nutrients diffuse into the blood from the stomach & intestines and are transported around the body. • Waste water is taken to the bladder to be removed. 	<ul style="list-style-type: none"> • Nutrients stay within the digestive system. 	digestive system, circulatory system, nutrient, circulation, arteries, veins, stomach, intestines, bladder, excrete
Forces			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	<ul style="list-style-type: none"> • Forces are a push or a pull. • Gravity is a pulling force produced by the Earth. • Gravity pulls towards the centre of the Earth. • All objects have gravity, but an object has to be truly massive to allow the gravity to have an effect. 	<ul style="list-style-type: none"> • Gravity pulls “down” – it pulls towards the centre of the Earth, • Gravity only exists on Earth. 	gravity, push, pull, force, centre, mass, fall
air resistance, water resistance and friction all have an effect when they act between moving surfaces.	<ul style="list-style-type: none"> • Air resistance acts when something moves through the air. • Water resistance acts when something moves through water. • Friction acts when something moves against a solid. 	<ul style="list-style-type: none"> • There is no resistance moving through the air. 	air resistance, water resistance, friction, surfaces

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	<ul style="list-style-type: none"> Air resistance, water resistance and friction are all pulling forces. 		
some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	<ul style="list-style-type: none"> Basic knowledge of what levers, pulleys and gears are and how they work. The longer the lever, the less force needed to move the object. 	<ul style="list-style-type: none"> If you apply the force close to the object it will have greater effect (use eg of door – we push further from the hinges to make it easier). 	mechanism, lever, pulley, gear, force, apply
Living Things and their Habitats			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
differences in the life cycles of a mammal, an amphibian, an insect and a bird.	<ul style="list-style-type: none"> Mammals life cycle – live birth, child, adult, Amphibian – egg birth, tadpole, adult (start in water, end on land) Bird – egg, chick, adult Insect – egg, larvae, pupa, adult 	<ul style="list-style-type: none"> Mammals don't have eggs - internal. tadpoles are only baby frogs. 	life cycle, grow, mature; mammal - young, baby, live birth,; insect - egg, larvae, pupa, adult; amphibian – egg/spawn, tadpole, adult; bird - egg, chick, adult
describe the life process of reproduction in some plants and animals.	<ul style="list-style-type: none"> Asexual reproduction is where the parent reproduces completely on its own. This is most common in plants but can also happen in animals Understand the difference between internal fertilisation (eg mammals, reptiles, birds) and external fertilisation (eg fish) A basic understanding of human sexual reproduction. 	<ul style="list-style-type: none"> Mammals (including humans) do not produce eggs. 	reproduction, egg, ovary, sperm, live birth, internal/external fertilisation, incubate, young, asexual, seeds
living things are classified into broad groups according to common observable	<ul style="list-style-type: none"> Living things have different characteristics (nocturnal, 	<ul style="list-style-type: none"> All plants flower. spiders are insects. All birds fly. 	micro-organism, plant, animal, vertebrate, invertebrate, mammal, reptile, fish, bird,

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<p>characteristics and based on similarities and differences, including micro-organisms, plants and animals.</p>	<p>plant, animal, herbivore, winged, predators etc)</p> <ul style="list-style-type: none"> • Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. • Plants can make their own food whereas animals cannot. • Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). • Vertebrates can be divided into eight small groups: fish; amphibians; reptiles; birds; insects; arachnids; crustaceans and mammals. • Each group has common characteristics. • Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. • Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. 		<p>insect, amphibian, crustacean, arachnid, flowering, non-flowering</p>
Earth and Space			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary

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<p>the movement of the Earth, and other planets, relative to the Sun in the solar system.</p>	<ul style="list-style-type: none"> • The names and order of the planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto-note “dwarf planet”) • The relative sizes of the planets. • Different types of planets (rock, gas giants, dwarf planets) • General facts – eg Saturn’s rings. • Earth and the other planets orbit the sun. • One orbit of the sun is known as a year. • Earth’s year is 365 days, 6 hours, 9 minutes and 10 seconds (a sidereal year). The extra hours are made up every 4 years as an extra day – A Leap Year. • The planets take different times to orbit the sun (length of a “year” is different). • The orbits of the planets are different shapes and none are exactly circular. 	<ul style="list-style-type: none"> • The Sun goes around the Earth. • Orbits are circular. • Planets are evenly spaced out. • Orbits are all parallel • A year is the same for all planets. • All planets are made of rock. 	<p>Earth, Sun, solar system, Milky Way, planet (planet names), orbit, sidereal, year, rocky planet, gas giant,</p>
<p>Sun, Earth and Moon are approximately spherical bodies.</p>	<ul style="list-style-type: none"> • Sun, Earth and Moon are approximately spherical. • None of them are exact spheres. 	<ul style="list-style-type: none"> • They are exact spheres 	<p>Earth, Sun, Moon, sphere, approximate, spherical</p>
<p>the movement of the Moon relative to the Earth.</p>	<ul style="list-style-type: none"> • Understand that the Moon orbits the Earth. 	<ul style="list-style-type: none"> • The moon orbits the Sun. 	<p>moon, Earth, orbit, month, Lunar Month, New Moon, Crescent,</p>

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	<ul style="list-style-type: none"> The Moon's orbit is approx. 28 days which is approx. one month 	<ul style="list-style-type: none"> The Moon's orbit is one month (each month is different) The Moon is the only moon – other planets have many moons. 	Half, Gibbous, Full, Waxing, Waning, Lunar Eclipse
the Earth's rotation explains day and night and the apparent movement of the sun across the sky.	<ul style="list-style-type: none"> The Earth turns on its axis. Earth takes approx. 24 hours (23 hours, 56 mins – called the sidereal period) to spin on its axis. The axis is the reason for the seasons – when tilted away from the Sun, it is Winter, towards the Sun is Summer. Also explains shift in length of day/night. 	<ul style="list-style-type: none"> Earth is straight up – North Pole perfectly on top, South Pole perfectly on bottom. Sun goes round the Earth. The Earth spins slower in Summer/Winter so the day/night is longer. 	rotation, day, night, axis, tilt, poles, North Pole, South Pole, hemisphere
Properties and Changes of Materials			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
everyday materials can be grouped together on the basis of their properties.	<ul style="list-style-type: none"> Group a variety of materials independently based on properties such as hardness, waterproof, density etc. 	<ul style="list-style-type: none"> certain materials all have same properties eg rocks all hard, metals all solid. 	hardness, solubility, transparency, conductivity (electrical and thermal), and attract/repel magnets
some materials will dissolve in liquid to form a solution, and how to recover a substance from a solution.	<ul style="list-style-type: none"> Some materials dissolve in liquid to form a solution. Dissolving is a reversible change. Substances can be recovered from a solution. 	<ul style="list-style-type: none"> Substances "disappear" in a liquid. Once a substance has dissolved it is gone forever. 	substance, dissolve, solution, reversible,
mixtures might be separated	<ul style="list-style-type: none"> A mixture can be separated. 	<ul style="list-style-type: none"> A mixture of very small things is impossible to separate. 	mixture, filtering, sieving, evaporating separate

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reasons for the particular uses of everyday materials for specific products, including metals, wood and plastic	<ul style="list-style-type: none"> Identify, using properties, why given materials are used for specific products. 	<ul style="list-style-type: none"> metals are always solid (look at mercury use in thermometers) 	properties, products, suitable, unsuitable, metal, wood, plastic
dissolving, mixing and changes of state are reversible changes.	<ul style="list-style-type: none"> Dissolving, mixing and changes of state are reversible changes. Understand a reversible change means the original material can be retrieved. Reversible changes are a physical change 	<ul style="list-style-type: none"> The original material will look exactly the same – eg sugar crystals. 	reversible, physical, dissolving, mixing, change of state
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.	<ul style="list-style-type: none"> Irreversible change forms new materials. Irreversible changes are a chemical change. Understand an irreversible change means the original is gone forever. Recognise burning is irreversible. 	<ul style="list-style-type: none"> smoke is not a material – note carbon. 	chemical, formation, material, burning, acid
Electricity			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
the brightness of a lamp or the volume of a buzzer is affected by the number and voltage of cells used in the circuit.	<ul style="list-style-type: none"> More/higher voltage cells in a circuit: brighter lamp/louder buzzer etc. Less/lower voltage cells in a circuit: duller lamp/quieter buzzer etc. 	<ul style="list-style-type: none"> It doesn't matter how many cells there are, "a light is a light" etc 	cell, voltage, brightness, bulb volume, buzzer, circuit
know about variations in how components function, including the brightness of bulbs, the	<ul style="list-style-type: none"> As above with cell quantity/ voltage. 	<ul style="list-style-type: none"> A switch is the only way to affect performance of components. 	component, performance, bulb, buzzer, switch

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loudness of buzzers and the on/off position of switches.	<ul style="list-style-type: none"> A switch will cause components to begin/cease performing. 		
recognised symbols for representing a simple circuit in a diagram.	<ul style="list-style-type: none"> Use correct symbols for: wire, cell, buzzer, bulb, switch, motor Accurately draw simple circuit diagrams. 	<ul style="list-style-type: none"> a cell is a battery – not that a battery is made of multiple cells. 	symbol, circuit diagram, wire, cell, buzzer, bulb, switch, motor
Evolution and Inheritance			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	<ul style="list-style-type: none"> Many species are extinct. We only know what we have learned from fossils or written/art sources. Most living things have changed over time – they may have become bigger, smaller, or changed their diet to survive. Fossils provide information about many extinct species, but particularly dinosaurs. We can tell how old fossils are using carbon dating. 	<ul style="list-style-type: none"> The Earth was made in 7 days (even the Pope has said the Bible means seven stages) Dinosaurs are not real. Dragons existed. Fossils are always the actual bone – can be imprints, impressions, DNA etc 	evolution, imprint, impression, DNA, fossils, evidence, carbon dating
living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.	<ul style="list-style-type: none"> Living things produce offspring of the same kind (eg humans produce humans, tulips produce tulips) Offspring generally share similarities with their parents. Most offspring have differences to their parents. 	<ul style="list-style-type: none"> Offspring are exactly like parents. Offspring are exactly 50% of each parent. Nothing produces exact replica offspring (some asexual do produce replicas) 	offspring, reproduce, adapted, similar, varied, parents, genes
animals and plants are adapted to suit their environment in	<ul style="list-style-type: none"> Animals and plants adapt to their environments. 	<ul style="list-style-type: none"> God made everything how it is. 	suited, species, adaptation, permanent, evolution

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<p>different ways and that adaptation may lead to evolution.</p>	<ul style="list-style-type: none"> • The best suited of animals and plants survive better. • Eventually an adaptation can lead to permanent change in a species (eg peppered moth originally 98% white, 2% dark. After industrial revolution 95.5% black because white ones could no longer hide due to pollution). • Permanent change in a species is known as evolution. • Evolution can take hundreds, thousands, even millions of years. 	<ul style="list-style-type: none"> • Evolution didn't happen because the Bible doesn't contain it. 	
Light			
Pupils should be taught to:	Substantive Knowledge	Common Misconceptions	Vocabulary
<p>light appears to travel in straight lines.</p>	<ul style="list-style-type: none"> • Light is created by a light source. • Light moves in straight lines. • Light can be bent. • Light can be split. 	<ul style="list-style-type: none"> • Light can curve around things on its own. 	<p>light, light source, ray, straight line, bend, refraction, rainbow</p>
<p>objects are seen because they give out or reflect light into the eye.</p>	<ul style="list-style-type: none"> • Main parts of the eye (pupil, iris, cornea, retina) • The pupil is where the light enters our eye. • The retina is where the light is received by our eye and the information is then sent to the brain. • Sight is not an "active" sense. • Eyes are "input" organs, not "output" – they receive light 	<ul style="list-style-type: none"> • Looking at something is an active process. • Eyes output something which helps us to see. 	<p>reflect, eye, eyeball, pupil, iris, cornea, retina</p>

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	and interpret it. They do not actively "see".		
we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.	<ul style="list-style-type: none"> • Light is created by a light source. • We see when light enters our eye and is read by the retina. • Light reflects from objects into our eyes, and this is how we see. 	<ul style="list-style-type: none"> • We see because we "look at" an object. • Squinting your eyes will help you see better. 	light source, travel, straight line reflect, retina, sight
shadows have the same shape as the objects that cast them.	<ul style="list-style-type: none"> • An object can only cast the shape of itself. • The shape can be stretched or compressed by the angle of the light. • The shape can be made larger or smaller by the distance from the light source. 	<ul style="list-style-type: none"> • A shadow can only be the same size as the object. • A shape can cast different shaped shadows – the shape can be stretched or change size, but will be the same shape. 	light source, shadow, block, opaque, shape, size, distance, angle, cast