

Science Progression

Intent of the curriculum

At Woodseaves, we recognise the importance of science in every aspect of daily life. The intent of our science curriculum is focused on increasing pupils' knowledge and understanding of our world, and with developing skills associated with science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence.

At Woodseaves, following the aims of the National Curriculum, our science teaching offers opportunities for children to:

Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics;

Develop an understanding of the nature, processes and methods of science through different types of enquiries that help children to answer scientific questions about the world around them;

Be equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Develop the essential scientific enquiry skills to deepen their scientific knowledge.

Use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.T., diagrams, graphs and charts.

Develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.

Develop an enthusiasm and enjoyment of scientific learning and discovery.

Early Learning Goal and National Curriculum Links

EYFS	Key Stage One	Lower Key Stage Two	Upper Key Stage Two
<p>Animals, including humans: Explore the natural world around them, making observations and drawing pictures of animals. Know some similarities and differences between the natural world around them and contracting environments, drawing on their experiences and what has been read in class.</p> <p>Plants: Explore the natural world around them, making observations and drawing pictures of plants. Know some similarities and difference between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p> <p>Everyday materials: Pupils will distinguish between an object and the material from which it is made. They will identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. They will begin to describe and compare the simple physical properties of a variety of everyday materials.</p> <p>Seasonal change: Pupils will observe changes across the year and the four seasons. Pupils will observe and describe weather associated with the seasons.</p>	<p>Working Scientifically Year 1 and 2:</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>Year 1</p> <p>Plants:</p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. <p>Animals, including humans:</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. <p>Everyday materials:</p> <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. <p>Seasonal changes:</p> <ul style="list-style-type: none"> Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies. <p>Year 2</p> <p>Living things and their habitats:</p> <ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including microhabitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. <p>Plants:</p> <ul style="list-style-type: none"> 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>Animals, including humans:</p> <ul style="list-style-type: none"> 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 	<p>Working Scientifically Year 3 and 4:</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 simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. <p>Year 3</p> <p>Plants:</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, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <p>Animals, including humans:</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. <p>Rocks:</p> <ul style="list-style-type: none"> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. <p>Light:</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 the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. <p>Forces and magnets:</p> <ul style="list-style-type: none"> Compare how things move on different surfaces. Notice that some forces need contact between 2 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. Describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. <p>Year 4</p> <p>Living things and their habitats:</p> <ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. <p>Animals, including humans:</p> <ul style="list-style-type: none"> 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. States of matter: 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 	<p>Working Scientifically Year 5 and 6:</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 of and a degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments. <p>Year 5 Living Things:</p> <ul style="list-style-type: none"> Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. <p>Animals, including humans:</p> <ul style="list-style-type: none"> Describe the changes as humans develop to old age. Properties and changes of materials: 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. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. <p>Earth and space:</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. <p>Forces:</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 effects 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>Year 6 Living things and their habitats:</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. <p>Animals including humans:</p> <ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. <p>Evolution and inheritance:</p> <ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that

<p>humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>Uses of everyday materials: • 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.</p>	<p>water cycle and associate the rate of evaporation with temperature. Sound: • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds 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. • Recognise that sounds get fainter as the distance from the sound source increases. Electricity: • Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, 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>	<p>adaptation may lead to evolution. Light: • 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. Electricity: • 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>
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At Woodseaves children will:

Scientific Enquiry / Identifying, classifying and grouping / Observing over time / Pattern seeking / Comparative and Fair testing / Researching using secondary resources

Scientific Enquiry	Identifying, classifying and grouping / Observing over time / Pattern seeking / Comparative and Fair testing / Researching using secondary resources						
	EYFS	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
Working Scientifically	Describe what they see, hear and feel whist outside. Explore the natural world around them, making observations	<p>Ask simple questions.</p> <p>Perform simple tests.</p> <p>Observe closely.</p> <p>Observe changes over time.</p> <p>Use simple features to compare objects, materials and living things.</p> <p>Gather and record simple data.</p> <p>Explain the process of enquiry.</p> <p>Use results to suggest answers to questions.</p> <p>Use simple secondary sources to find answers.</p>	<p>ask simple questions and recognise they can be answered in different ways.</p> <p>observe closely using simple equipment.</p> <p>perform simple tests and begin to recognise ways in which they might answer scientific questions.</p> <p>begin to notice patterns and relationships.</p> <p>decide how to sort and group objects, materials and living things.</p> <p>gather and record simple data in different ways.</p> <p>Discuss what they have found out and how.</p> <p>use results to suggest answers to questions, using simple scientific language.</p> <p>use secondary sources to find answers.</p>	<p>ask relevant questions and consider how they can be answered.</p> <p>make systematic and careful observations</p> <p>set up simple practical enquiries including comparative tests.</p> <p>develop own criteria for grouping, sorting and classifying.</p> <p>gather and record findings using drawings and labelled diagrams.</p> <p>report on findings from enquiries using oral explanations.</p> <p>use results to draw simple conclusions and suggest improvements.</p> <p>use straightforward scientific evidence to answer questions.</p>	<p>ask relevant questions and consider different types of enquiries to answer them.</p> <p>take accurate measurements using standard units, using a range of equipment.</p> <p>set up simple practical enquiries, including comparative and fair tests.</p> <p>select and plan the most appropriate type of scientific enquiry. To recognise when and how to set up comparative and fair tests.</p> <p>gather and record findings using keys, bar charts and tables.</p> <p>report on findings from enquiries using oral explanations, displays and presentation of results and conclusions.</p> <p>use results to make predictions for new values and raise further questions.</p> <p>use straightforward scientific evidence to answer questions and support their own findings.</p>	<p>raise a breadth of topic specific questions.</p> <p>observe and take measurements using a range of scientific equipment with increasing accuracy.</p> <p>select and plan the most appropriate type of scientific enquiry.</p> <p>recognise when and how to set up comparative and fair tests.</p> <p>use keys to identify, classify and describe living things and materials.</p> <p>gather and record results of increasing complexity using diagrams and labels, classification keys and tables.</p> <p>report and present findings including conclusions and relationships.</p> <p>Use results to make predictions and set up further comparative and fair tests.</p> <p>Begin to identify scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Know how to choose appropriate variables to test a hypothesis.</p> <p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. •</p> <p>Use test results to make predictions to set up further comparative and fair tests.</p> <p>Know how to report and present findings from enquiries in a variety of oral and written forms. •</p> <p>Know how to identify scientific evidence that has been used to support or refute ideas or arguments.</p>
Vocabulary		Questions, answers, equipment, results, sort, explore, observe, similar, collect, measure, record, group, test, compare, describe, different, differences.	Chart, table, pictogram, tally chart, block diagram / graph, gather, order, notice patterns, link ideas, stop watch, pipette, syringe, use of comparatives – hotter/ cooler, older / younger etc	Scientific enquiry Similarities Differences Observations Keys Bar charts Thermometer Data logger Changes over time Identify Classify Evidence	Increase Decrease Accurate Appearance	Opinion Fact Variables Independent variable Dependent variable Controlled variable precision Classification keys Scatter graphs Line graphs Notice relationships Support	systematic Causal relationships Refute Degree of trust

				Conclusion Prediction Magnifying glass Microscope Comparative tests Fair test Careful Present Data Results Support Not support			
Biology	Explore the natural world around them. • Drawing pictures of plants. • To understand the effect of changing seasons on the natural world around them. To explore the natural world around them. • To recognise some environments that are different to the one in which they live. Draw pictures of animals.	Animals, including humans: 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 Plants: identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees. Seasonal Changes: observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies	Animals, including humans: 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. Plants: 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. Living things and their habitats: explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats • 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.	Animals, including humans: 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. Plants: 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, and room to grow) and how they vary from plant to plant • investigate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Living things and their habitats: recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • recognise that environments can change and that this can sometimes pose dangers to living things. Animals, including humans: 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.	Living things and their habitats: • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals. Animals, including humans: describe the changes as humans develop to old age.	Animals, including humans: identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans. Living things and their habitats: 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. Evolution and inheritance: recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Vocabulary		Fish, Reptiles, Mammals, Birds, Amphibians, Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak, body, eyes, teeth, mouth, tail, claw, fin, scales,	Survival, Water, Air, Food, Offspring, reproduction, growth, child, young/old stages e.g. chick/hen, baby/child/adult, caterpillar/butterfly Exercise, Hygiene, heartbeat, breathing, germs, disease, food types	Nutrition, Skeletons, Air, Light, Water, Nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones,	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	Life cycle, reproduce, fertilises, egg, live young, metamorphosis, plantlets, bulbs	Circulatory, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration. Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen,

		<p>feathers, fur, paws, hooves, vertebrate</p> <p>Senses – touch, see, smell, taste, hear</p> <p>Deciduous, Evergreen trees, Leaves, Flowers, Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem. Berry, bark, stalk, bud</p> <p>Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark. Sunny, rainy, windy, snowy, sunrise, sunset, day length</p>	<p>e.g. meat/fish/vegetables/bread/rice/pasta</p> <p>Light, shade, sun, warm, cool, grow, healthy Seeds, Bulbs, Water, Temperature, Growth. Leaves, Flowers, Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem. Berry, bark, stalk, bud</p> <p>Living, Dead, Never been alive, basic needs, shelter, Habitat, Energy, Food chain, Predator, Prey,</p> <p>Local habitats: Woodland, Pond, Habitats: Desert, oceans, rivers, forests, grasslands, polar regions, rockpools</p> <p>Micro-habitats : under logs, in leaves, in bushes, tree stump</p>	<p>muscles, joints, support, protect, move, skull, ribs, spine</p> <p>Soil, Reproduction, Transportation, Dispersal, Pollination, Flower, photosynthesis, pollen, seed formation</p>	<p>Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats.</p> <p>Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain</p>	<p>Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty.</p>	<p>carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle</p> <p>Classification, Micro-organisms, Mammals, Insects. Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering</p> <p>Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, species</p>
Outdoor learning		<ul style="list-style-type: none"> Plant a class garden. Plant a few seeds or flowers and watch them grow (learn about the lifecycle of a plant and pollination). Create simple food chains for a familiar local habitat from first-hand observation and research. Find a range of items outside that are living, dead and never lived. Observe animals and plants carefully, drawing and labelling diagrams. Create simple food chains for a familiar local habitat from first-hand observation and research. Collect information about the weather regularly throughout the year. Identify sounds they could hear outdoors using their senses. Explore using our senses in the school garden and describe the textures and smell of the plants. E.g. smooth, sticky, floral. Draw around a pupil on the playground with chalk and name/label the basic body parts. 		<ul style="list-style-type: none"> Investigate patterns asking questions such as: Can people with longer legs run faster? Can people with bigger hands catch a ball better? 		<ul style="list-style-type: none"> Children show the movement of the blood around the circulatory system by using red and blue bean bags and hoops to show the oxygenated and deoxygenated blood. Linking Science to PE, the children draw a picture of what they think the inside of their body looks like. After a warm-up for a PE lesson, they take note and describe what they feel like on the inside after the effects of the exercise. E.g. I could feel my heart beating fast. Children perform different types of exercise for a minute and then measure their pulse rates. Children choose one type of exercise to raise their pulse rate and then measure it at regular intervals after the exercise to see how it changes over time 	
Chemistry	<p>Use all their senses in hands-on explorations of natural material.</p> <ul style="list-style-type: none"> Explore collections of materials with similar and/ or different properties. Talk about the differences between materials and changes they notice. 	<p>Everyday materials: distinguish between an object and the material from which it is made</p> <ul style="list-style-type: none"> 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. 	<p>Uses of everyday materials: identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <ul style="list-style-type: none"> find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<p>Rocks:</p> <ul style="list-style-type: none"> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter 	<p>States of matter: compare and group materials together, according to whether they are solids, liquids or gases</p> <ul style="list-style-type: none"> 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. 	<p>Properties and changes of matter: 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</p> <ul style="list-style-type: none"> 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 demonstrate that dissolving, 	

						<p>mixing and changes of state are reversible changes • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>	
Vocabulary		<p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p>	<p>wood, metal, plastic, glass, brick, rock, paper, cardboard hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p>	<p>Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil</p>	<p>solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p>	<p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p>	
Outdoor Learning		<ul style="list-style-type: none"> Identify different objects of different textures outside. Identify objects made of different materials that they could see in three different locations – from their seat, around the classroom, and in the playground. Use a range of materials to test outside to identify which are waterproof and suitable for making a shelter. 		<ul style="list-style-type: none"> Conduct a rock detective walk to begin to recognise the different types of rocks, their physical properties in their natural state and their uses. Then began to describe the rocks and develop choices of vocabulary. Conduct a rock detective walk around the local environment, including visiting local places e.g. parks and buildings. Experiment with different materials and shapes to testing what floats and what sinks. Take a large container outside filled with water, then make small boats out of different materials (paper, lollipops, foil, sponge etc). 			
Physics				<p>Forces and magnets: compare how things move on different surfaces • notice that some forces need contact between 2 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 • describe magnets as having 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing. Light: 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 •</p>	<p>Electricity: identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, 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>	<p>Earth and Space: 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. Forces: explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act</p>	<p>Light: 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. Electricity: 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</p>

				<p>recognise that light from the sun can be dangerous and that there are ways to protect their eyes • recognise that shadows are formed when the light from a light source is blocked by an opaque object • find patterns in the way that the size of shadows change.</p>	<p>Sound:</p> <ul style="list-style-type: none"> • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds 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 • recognise that sounds get fainter as the distance from the sound source increases. 	<p>between moving surfaces • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p>	<p>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>
Vocabulary				<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p> <p>Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole</p>	<p>Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol</p> <p>Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p>	<p>Axis, Rotation, Day, Night, Phases of the Moon, star, Constellation, Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets</p> <p>Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears</p>	<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, straight lines, light rays, reflection, law of reflection, refraction, spectrum</p> <p>Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage, amps, wires</p>
Outdoor learning				<ul style="list-style-type: none"> • Make string telephones and test them outside. They could also experiment with using the string telephone around corners. • Explore tapping wood and metal structures and seeing what the children could hear when they put their ears to the other end. Give a string telephone to try out and also investigate how the sound of clapping travels across the playground. • Use musical instruments to measure sounds at different distances on the playground. You can measure the increase/decrease in volume depending on the distance from the sound source. • Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground. 	<ul style="list-style-type: none"> • Outside use a parachute to learn about gravity and air resistance. Use different materials, like cloth, plastic or paper, and see which can float the longest. • In the local playground, children explore how friction affects their movement. E.g. They explore how the material they are sitting on affects how quickly they go down the slide. • Introducing the concept of air resistance the children run across the playground then repeat with an open umbrella (or an item similar) held in front of them to feel the effect of air resistance. • Compare the effect of air resistance on the distance something can travel outside. E.g. compare throwing a rugby ball and a beanbag. • Use a tennis racket to hit a ball up in the air. The children can explore the different forces – gravity and air resistance. • Explore larger levers and pulleys on different equipment on the playground. 		

Diversity		<p>Harry Bhadeshia - Materials Saiful Islam - Materials Jasseln Majeবাদia - Materials, Engineering, Physics</p>	<p>Charlotte Armah – Food Research Jasseln Majeবাদia – Materials, Engineering, Physics Mark Richards – Physics Sanjeev Gupta – Earth Science/ Geology</p>	<p>Maggie Aderin – Pocock - Space Harry Bhadeshia - Materials Sanjeev Gupta – Earth Science/ Geology Mah Hussain-Gamble – Chemistry Saiful Islam - Materials Jasseln Majeবাদia - Materials, Engineering, Physics Jo Shein Ng - Electrics</p>
Christian Values links	<p>Friendship, thankfulness, trust, peace, compassion, forgiveness, courage, hope, generosity, wisdom, koinonia.</p>	<p>Thankfulness, compassion, wisdom, koinonia.</p>	<p>Thankfulness, trust, wisdom, koinonia.</p>	<p>Thankfulness, peace, compassion, wisdom, koinonia.</p>
Cultural Capital Links Possibilities	<p>Possible visits: Wolseley Wildlife Centre Twycross Zoo</p>	<p>Possible visits: Wolseley Wildlife Centre Twycross Zoo Think Tank Sealife Centre</p>	<p>Possible visits: Think Tank Wolseley Wildlife Centre</p>	<p>Possible visits: Think Tank Jodrell Bank</p>