



Science at Breachwood Green School

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and skills, pupils at Breachwood Green School are encouraged to develop a sense of excitement and curiosity about the world around them. They are encouraged to understand how science can be used to explain what is occurring, predict how things will behave and analyse causes. At Breachwood Green School children will build on the essential aspects of scientific knowledge and working scientifically skills. Learning through enquiry will enable children to ask more questions and develop their own explanations, as well as being able to draw conclusions from data. The documents below highlight the working scientific skills and scientific knowledge children will gain at each stage of the curriculum.



Progression in Science

The table shows when concepts should be secured. It is very important, therefore, that the content in earlier years be **revisited** in subsequent years to consolidate knowledge and build on pupils' understanding. Teachers should also go beyond the content set out here if they feel it is appropriate.

Progression in Science – EYFS, KS1, Lower KS2 and Upper KS2

EYFS children study science in a variety of exciting topics which put science into context. In KS1 and KS2 biology related topics include living things and their habitats, evolution and inheritance and animals including humans. Chemistry related topics include properties and changes in materials. Physics oriented topics include forces, light, electricity, Earth and space. Throughout their science topics, our children are encouraged to understand how science can be used to explain what is happening, predict how things will behave, and analyse causes. Practical enquires enable children to share their findings, working to become effective communicators of scientific ideas, facts and data. The following show the progression of working scientifically skills and scientific knowledge taught during EYFS, KS1 and KS2. By the end of their primary education, our children will be able to use different types of science enquiries that help them answer scientific questions about the world around them. Children who feel confident in their science knowledge and enquiry skills will be excited about science, show that they are actively curious to learn more and will see the relevance of what they learn in science lessons to real-life situations and also the importance of science in the real world.

	EYFS	KS1	Lower KS2	UPKS2
Asking Questions	Pupils can: <ul style="list-style-type: none"> • make comments about what they have heard and ask questions to clarify their understanding. • participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. 	Pupils can: <ul style="list-style-type: none"> • ask simple questions and recognise that they can be answered in different ways 	Pupils can: <ul style="list-style-type: none"> • ask relevant questions and use different types of scientific enquiries to answer them • set up simple practical enquiries, comparative and fair tests 	Pupils can: <ul style="list-style-type: none"> • plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

	EYFS	KS1	Lower KS2	UPKS2
Measuring and Recording	<p>Pupils can:</p> <ul style="list-style-type: none"> make comparisons between objects relating to size, length, weight and capacity. begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...' 	<p>Pupils can:</p> <ul style="list-style-type: none"> observe closely, using simple equipment perform simple tests gather and record data to help in answering questions 	<p>Pupils can:</p> <ul style="list-style-type: none"> make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables gather, record, classify and present data in a variety of ways to help in answering questions 	<p>Pupils can:</p> <ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs
Concluding	<p>Pupils can:</p> <ul style="list-style-type: none"> offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate. 	<p>Pupils can:</p> <ul style="list-style-type: none"> identify and classify observe closely using equipment use their observations and ideas to suggest answers to questions 	<p>Pupils can:</p> <ul style="list-style-type: none"> identify differences, similarities or changes related to simple scientific ideas and processes report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions use straightforward scientific evidence to answer questions or to support their findings 	<p>Pupils can:</p> <ul style="list-style-type: none"> identify scientific evidence that has been used to support or refute ideas or arguments report and present findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations
Evaluating	<p>Pupils can:</p> <ul style="list-style-type: none"> express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher. 		<p>Pupils can:</p> <ul style="list-style-type: none"> use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 	<p>Pupils can:</p> <ul style="list-style-type: none"> use test results to make predictions to set up further comparative and fair tests

	EYFS	KS1	Lower KS2	UPKS2
Plants	<p>Pupils can:</p> <ul style="list-style-type: none"> • identify something as a plant • name some common plants, • identify leaf, root, stem and flower • recognise that plants need water to grow • identify the seeds in a fruit • plant seeds and care for growing plants. • understand the key features of the life cycle of a plant • begin to understand the need to respect and care for the natural environment and all living things. • explore the natural world around them, making observations and drawing pictures of plants. 	<p>Pupils can:</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 • observe how plants change over time • observe and describe how seeds and bulbs grow into mature plants • compare the lifecycle for a plant from a seed with that from a bulb • know that a seed and bulb both contain everything a plant needs to grow • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy 	<p>Pupils can:</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 • know that plants make their own food • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal 	

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Living things and their habitats	<p>Pupils can:</p> <ul style="list-style-type: none"> • identify something as an animal and name some places animals live • talk about the features of their own immediate environment and how environments might vary from one another. • make observations of animals and plants and explain why some things occur, and talk about changes • use their observations to describe humans and animals • 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. • begin to understand the need to respect and care for the natural environment and all living things 	<p>Pupils can:</p> <ul style="list-style-type: none"> • explore and compare the difference between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including micro-habitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food 	<p>Pupils can:</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>Pupils can:</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 • 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

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Evolution and inheritance	<p>Pupils can:</p> <ul style="list-style-type: none"> notice and ask questions about differences, such as skin colour, types of hair, gender, special needs and disabilities, and so on. 			<p>Pupils can:</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 year 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.
Seasonal Changes	<p>Pupils can:</p> <ul style="list-style-type: none"> to name the seasons understand the effect of changing seasons on the natural world around them. describe what they see, hear and feel whilst outside. 	<p>Pupils can:</p> <ul style="list-style-type: none"> observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies 		

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Animals including Humans	<p>Pupils can:</p> <ul style="list-style-type: none"> identify something as an animal and name some places animals live identify and locate parts of the body (eye, ear, knee, finger, foot, mouth, nose, stomach, eyebrow, arm, tongue, toe, forehead, chest, hand, leg) and parts of animal bodies. use their observations to describe humans and animals name a very limited range of food identify types of exercise changes as they grow from a baby to an adult and name baby, child, adult and the young of some other animals. explore the natural world around them, making observations and drawing pictures of animals. 	<p>Pupils can:</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. start to understand the lifecycles of animals and humans. compare how they are now to when they were a baby and explain some of the changes that will happen as they get older. use correct names for penis, testicles, anus, vagina, vulva, and give reasons why they are private. 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>Pupils can:</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>Year 3</p> <ul style="list-style-type: none"> understand that in animals and human lots of changes happen between conception and growing up, and that it is usually the female who has the baby. explain how boys' and girls' bodies change on the outside during the growing up process. understand how babies grow and develop in the mother's uterus and understand what a baby needs to live and grow. <p>Year 4</p> <ul style="list-style-type: none"> understand that boys' and girls' bodies need to change so that when they grow up their bodies can make babies. identify how boys' and girls' bodies change on the outside and inside during this growing up process (puberty) and conception in simple terms correctly label the internal and external parts of male and female bodies that are necessary for making a baby (testicles, sperm, penis, ovaries, egg, ovum/ova, womb/uterus, vagina/vulva). 	<p>Pupils can:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age. describe how boys and girls change during puberty and why looking after myself physically and emotionally is important. <p>Year 5</p> <ul style="list-style-type: none"> describe how a girl's body changes in order for her to be able to have babies when she is an adult, and that menstruation (having periods) is a natural part of this and understand the importance of looking after themselves physically (sanitary towels, sanitary pads, tampons, oestrogen) understand that sexual intercourse can lead to conception and that is how babies are usually made. to understand that sometimes people need ivf to help them have a baby. <p>Year 6</p> <ul style="list-style-type: none"> describe how a baby develops from conception (including ivf) through the nine months of pregnancy and how it is born. understanding conception (including ivf) to birth of a baby. identify and name the 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.

	EYFS	KS1	Lower KS2	UPKS2
Materials/Rocks/States of Matter	<p>Pupils can:</p> <ul style="list-style-type: none"> • use all their senses in hands-on exploration of natural materials. • explore collections of materials with similar and/or different properties. • talk about what they see, using a wide vocabulary. • talk about the differences between materials and changes they notice. • understand some important processes and changes in the natural world around them, including changing states of matter. 	<p>Pupils can:</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 (both visible and nonvisible) • identify and compare the uses 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>Pupils can:</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 • 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 	<p>Pupils can:</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 • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • 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 • 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

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Electricity	<p>Pupils can:</p> <ul style="list-style-type: none"> • know electricity can be dangerous • explore how things work. 		<p>Pupils can:</p> <ul style="list-style-type: none"> • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, 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>Pupils can:</p> <ul style="list-style-type: none"> • use recognised symbols when representing a simple circuit in a diagram • 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

	EYFS	KS1	Lower KS2	UPKS2
Light and Sound	<p>Pupils can:</p> <ul style="list-style-type: none"> • know that it is dangerous to look at the sun • relate their sense of sight to their eyes • relate their sense of hearing to their ears • explore the natural world around them. 		<p>Pupils can:</p> <ul style="list-style-type: none"> • recognise that light from the sun can be dangerous and that there are ways to protect their eyes • 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 shadows are formed when the light from a light source is blocked by a solid object • find patterns in the way that the size of shadows change • 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>Pupils can:</p> <ul style="list-style-type: none"> • recognise that light appears to travel in straight lines • 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 that objects are seen because they give out or reflect light into the eye • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

	EYFS	KS1	Lower KS2	UPKS2
Forces and magnets	<p>Pupils can:</p> <ul style="list-style-type: none"> explore and talk about different forces they can feel. 		<p>Pupils can:</p> <ul style="list-style-type: none"> compare how things move on different surfaces 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 notice that some forces need contact between two objects, but magnetic forces can act at a distance describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing 	<p>Pupils can:</p> <ul style="list-style-type: none"> identify the effects of air resistance, water resistance and friction, that act between moving surfaces explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect
Earth and space	<ul style="list-style-type: none"> know that we live on the planet called earth recognise some environments that are different to the one in which they live. 			<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

Science Long Term Planning Overview - 2 year plan

Cycle A	Autumn Term	Spring Term	Summer Term
KS1	Everyday Materials (Y1 unit) Seasonal Changes (Y1 unit)	Plants in the Garden (Y1 unit) Seasonal Changes (Y1 unit)	Growth and Survival (Y2 unit) Seasonal Changes (Y1 unit)
LKS2	Light and Shadows (Y3 unit) Circuits and Components (Y4 unit)	Investigating Plants (Y3 unit)	Classification and interdependence including food chains (Y4 unit) Sound and Vibrations (Y4 unit)
UKS2	Forces (Y5 unit) Electricity (Y6 unit)	Life Cycles (Y5 unit) Humans and Health (Y6 unit)	Earth and Space (Y5 unit) Life Cycles continued (Y5 unit)
Cycle B	Autumn Term	Spring Term	Summer Term
KS1	Uses of Everyday Materials (Y2 unit) Seasonal Changes (Y1 unit)	Growing Plants (Y2 unit) Habitats of plants (Y2 unit)	Different Animals (Y1 unit) Habitats of animals (Y2 unit)
LKS2	Healthy Eating and Healthy Bodies (Y3 unit) Teeth and Digestion (Y4 unit)	Forces and Magnets (Y3 unit) Circuits and Components (Y4 unit)	Rocks, Fossils and Soil (Y3 unit) Solids, Liquids and Gases (Y4 unit)
UKS2	Earth and Space (Y5 unit) Life Cycles (Y5 unit)	Changes of Materials (Y5 unit)	Classification, Evolution and Inheritance (Y6 unit)

Hfl Primary Science Scheme of Work – knowledge for each unit detailed; working scientifically skills should be embedded in each unit of work; assessment resources including assessment tasks