



GAINSBOROUGH PRIMARY & NURSERY SCHOOL

SUBJECT OVERVIEW SCIENCE



Our science curriculum follows the purpose and aims of the National Curriculum in England for Key Stages 1 and 2. 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; all our pupils are taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

Our curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future



GAINSBOROUGH PRIMARY & NURSERY SCHOOL

SUBJECT OVERVIEW – SCIENCE



	Early Years Foundation stage Reception/ Nursery	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
Intent	To provide the learning foundations to support knowledge skills and understanding.	To build on previous knowledge, skills and understanding. Year 1 focus on the statutory requirements from the National Curriculum.	To build on previous knowledge, skills and understanding. Year 2 focus on the statutory requirements from the National Curriculum.	To build on previous knowledge, skills and understanding. Year 3 focus on the statutory requirements from the National Curriculum.	To build on previous knowledge, skills and understanding. Year 4 focus on the statutory requirements from the National Curriculum.	To build on previous knowledge, skills and understanding. Year 5 focus on the statutory requirements from the National Curriculum.	To build on previous knowledge, skills and understanding. Year 6 focus on the statutory requirements from the National Curriculum.

Working scientifically	Offer their own ideas and explanations for why things might happen.	Ask simple questions and recognise that they can be answered in different ways.	Ask simple questions and recognise that they can be answered in different ways.	Ask relevant questions and use different types of scientific enquiries to answer them	Ask relevant questions and use different types of scientific enquiries to answer them	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
	Express their ideas and feelings about their experiences.	Observe closely, using simple equipment.	Observe closely, using simple equipment	Set up simple practical enquiries	Set up simple practical enquiries	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
	Listen attentively and respond to what they hear with relevant questions	Perform simple tests	Perform simple tests.	Make systematic and careful observations and, where appropriate, taking accurate measurements	Make systematic and careful observations and, where appropriate, taking accurate measurements	Record findings	Record data and results of increasing complexity using test results to make predictions and to set up further comparative and fair tests
	Make comments about what they have heard and ask questions to clarify their understanding.	Identify and Classify	Identify and Classify	Gather, record, classify and present data - record findings	Gather, record, classify and present data.	Report on findings from enquiries	Report and present findings from enquiries, including conclusions, causal relationships and explanations of a
		Use observations and ideas to give answers to questions	Use observations and ideas to give answers to questions	Report on findings from enquiries	Report on findings from enquiries	Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Record data and results of increasing complexity using test results to make predictions to set up further comparative and fair tests
		Gather and record data	Gather and record data	Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Identify differences, similarities or changes related to simple scientific ideas and processes	Record data and results of increasing complexity using test results to make predictions to set up further comparative and fair tests
	Investigate and experience things through play.			Use straightforward scientific evidence to	Use straightforward scientific evidence to	Identify differences, similarities or changes related to simple scientific ideas and processes	Record data and results of increasing complexity using test results to make predictions to set up further comparative and fair tests
						Identify differences, similarities or changes related to simple scientific ideas and processes	Record data and results of increasing complexity using test results to make predictions to set up further comparative and fair tests

				answer questions or to support their findings.	Use straightforward scientific evidence to answer questions or to support their findings.	degree of trust in results, in oral and written forms such as displays and other presentations. 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 degree of trust in results, in oral and written forms such as displays and other presentations Identify scientific evidence that has been used to support or refute ideas or arguments
--	--	--	--	--	---	--	---

Biology	<p>Plants >Use all their senses in hands-on exploration of natural materials. >Explore collections of materials with similar and/or different properties. >Plant seeds and care for growing plants. >Understand the key features of the life cycle of a plant and an animal. > Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Animals including humans >Know and talk about the different factors that support their overall health and wellbeing: regular physical activity; healthy eating; toothbrushing;</p>	<p>Plants Identify and name a variety of common wild and garden plants.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Animals including humans Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>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>	<p>Plants Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Animals including humans Notice that animals including humans have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of</p>	<p>Plants</p> <p>Identify and describe the functions of different parts of flowering plants</p> <p>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.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Animals including humans</p> <p>Construct and interpret a variety of food chains identifying producers, predators and prey.</p> <p>Describe the simple functions of the basic parts of the digestive system.</p> <p>Identify different types of teeth in humans and their functions.</p>	<p>Animals including Humans -Describe the changes as humans develop to old age.</p> <p>Living things and their habitats</p> <p>Describe the difference in the life cycles of a mammal, amphibian, insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p>	<p>Animals including Humans</p> <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals including humans.</p>
----------------	--	---	--	---	--	--	---

<p>sensible amounts of 'screen time'; having a good sleep routine; being a safe pedestrian.</p> <p>> Further develop the skills they need to manage the school day successfully: lining up and queuing; mealtimes; personal hygiene.</p> <p>>Talk about members of their immediate family and community.</p> <p>> Name and describe people who are familiar to them.</p> <p>> Recognise some environments that are different to the one in which they live.</p> <p>>Use all their senses in hands-on exploration of natural materials.</p> <p>>Begin to make sense of their own life-story and family's history.</p> <p>> Understand the key features of</p>	<p>Seasonal change</p> <p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>	<p>exercise, eating the right amount of different types of food and hygiene.</p> <p>Explore and compare the differences between things that are living, dead and things that have never been alive.</p> <p>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</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats. Describe how animals obtain their food from</p>	<p>Animals including humans</p> <p>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.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Living things and their habitats</p> <p>Recognise living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in the local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>		<p>Living things and their habitats</p> <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p>	<p>Evolution and adaptation</p>
---	--	---	--	--	--	--	--

	<p>the life cycle of a plant and an animal. >Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Living things and their habitats</p> <p>>Draw information from a simple map. >Explore the natural world around them. >Describe what they see, hear and feel whilst outside. > Recognise some environments that are different to the one in which they live</p> <p>Seasonal change</p> <p>>Explore the natural world around them. >Describe what they see, hear and feel whilst outside.</p>		<p>plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</p>				<p>Recognise that living things change over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
--	---	--	---	--	--	--	---

	> Understand the effect of changing seasons on the natural world around them						
--	--	--	--	--	--	--	--

<p style="text-align: center;">Chemistry</p>	<p>> Explore the natural world around them. > Describe what they see, hear and feel whilst outside. > Use all their senses in hands-on exploration of natural materials. > Explore collections of materials with similar and/or different properties. > Talk about the differences between materials and changes they notice.</p>	<p style="text-align: center;">Everyday Materials</p> <p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p style="text-align: center;">Uses of everyday materials</p> <p>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> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p style="text-align: center;">Rocks</p> <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<p style="text-align: center;">Materials- States of Matter</p> <p>Compare and group materials together according to whether they are solids, liquids and gases.</p> <p>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)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p style="text-align: center;">Properties and changes of materials</p> <p>Compare and group together everyday materials based on their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures can be separated through filtering, sieving and evaporation.</p>	
---	--	---	---	---	--	--	--

						<p>Give reasons, based on evidence from comparative and fair tests, for particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>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>	
--	--	--	--	--	--	---	--

<p style="text-align: center;">Physics</p>	<p>>Explore the natural world around them. > Describe what they see, hear and feel whilst outside >Explore how things work > Explore and talk about different forces they can feel. >Talk about the differences between materials and changes they notice.</p>			<p style="text-align: center;">Light</p> <p>Recognise that they need light in order to see things</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a opaque object.</p> <p>Find patterns in the way that size of shadows change</p>	<p style="text-align: center;">Sound</p> <p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases</p>	<p style="text-align: center;">Forces</p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction that act between moving surfaces.</p> <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</p>	<p style="text-align: center;">Light</p> <p>- To recognise that light appears to travels 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 why shadows have the same shape as the objects that cast them - Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p>

				<p>Forces and Magnets</p> <p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other.</p> <p>Compare and group together materials on the basis of whether they are attracted to a magnet</p> <p>Describe magnets as having 2 poles.</p> <p>Predict whether 2 magnets will attract or repel.</p>	<p>Electricity</p> <p>- Identify common appliances that run on electricity Construct a simple series circuit identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>Identify whether or not a lamp will light in a simple series circuit based on whether or not the lamp is part of a complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>Earth and Space</p> <p>Describe the movement of the Earth and other planets relative to the sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.</p>	<p>Electricity</p> <p>Associate lamp brightness or volume of a buzzer with the number/voltage of cells in the circuit</p> <p>Use recognised symbols in a simple circuit diagram</p> <p>Compare and give reasons for variations in how components function.</p>
--	--	--	--	--	--	--	---