



BEECHFIELD SCHOOL

Science Skills and Knowledge Progression

At Beechfield School, the Science curriculum aims to provide children with the foundations to understanding the world through Biology, Chemistry and Physics. We teach children to be curious and analytical through scientific enquiry. Children are taught to investigate natural phenomena by predicting, analysing and explaining.

EYFS		
Knowledge and Skills		Vocabulary
Nursery <ul style="list-style-type: none"> Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. Can talk about some of the things they have observed such as plants, animals, natural and found objects. Talks about why things happen and how things work. Developing an understanding of growth, decay and changes over time. Shows care and concern for living things and the environment. 		Natural Wild Log Stone Tree Leaves Seaside Fruit Vegetables Body Parts Plants Animals Grow Change Recycle
Reception <ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes. 		Wildlife Native Woodland Jungle Artic Ocean Dead Soil Waterproof Animals Plants Changes Lifecycle Seasons Weather
Assessment – RAG rate and note particular children - +		



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Key Stage 1

Year 1		
Knowledge	Skills	Vocabulary
<p>Plants</p> <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants including trees</p>	<ul style="list-style-type: none"> - Identify and classify (sort and group objects) - With help, record findings in a range of ways, e.g. simple tables, diagrams, pictograms and sorting circles - Use simple observable features to compare objects, materials and living things 	Deciduous Evergreen Stem Flower Seeds Seedling Branch Root Weed
<p>Animals including humans</p> <p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p>	<ul style="list-style-type: none"> - Identify and classify (sort and group objects) - With help, record findings in a range of ways, e.g. simple tables, diagrams, pictograms and sorting circles - Use simple observable features to compare objects, materials and living things 	Carnivores Herbivores Omnivores Fish Amphibians Reptiles Bird Mammals
<p>Everyday Materials</p> <p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of every day 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>	<ul style="list-style-type: none"> - Uses simple secondary sources to find answers, e.g. books, videos, photographs or people gathers and records simple data - Talks about their findings using everyday terms, text scaffolds or simple scientific language - Use simple observable features to compare objects, materials and living things 	Materials Manufactured Man-made Natural Properties Group Wood Plastic Glass Metal Water Rock
<p>Seasonal Changes</p> <p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>	<ul style="list-style-type: none"> - Ask simple questions and recognises that they can be answered in different ways - Use simple measurements and equipment to gather data - Observe closely (including changes over time), using simple equipment - Talk about what they have found out and how they found it out 	Seasons Spring Summer Winter Autumn Weather Length Change Hour Day
Assessment – RAG rate and note particular children - +		



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Year 2		
Knowledge	Skills	Vocabulary
<p>Living Things and Their Habitats</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</p> <p>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>	<ul style="list-style-type: none"> - Uses simple secondary sources to find answers, e.g. books, videos, photographs or people gathers and records simple data - With help, record findings in a range of ways, e.g. simple tables, diagrams, pictograms and sorting circles - Use simple observable features to compare objects, materials and living things 	<p>Living Non-living Habitats Food source Dead</p>
<p>Plants</p> <p>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>	<ul style="list-style-type: none"> - Ask simple questions and recognises that they can be answered in different ways - Perform simple tests by following the teachers' instructions - With guidance, suggests what they will do - Use resources provided or chosen from a limited range - With guidance from the teacher, suggest why a test is unfair - Use observations and ideas to suggest answers to questions - With support, suggest whether or not what happened was what they expected - With support, suggest different ways they could have done things 	<p>Grow Germinate Produce Reproduce Seed Stem Flower Seeds Branch Root Weed</p>
<p>Animals including Humans</p> <p>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 exercise, eating the right amounts of different types of food, and hygiene</p>	<ul style="list-style-type: none"> - Uses simple secondary sources to find answers, e.g. books, videos, photographs or people - Gathers and records simple data - With help, record findings in a range of ways, e.g. simple tables, diagrams, pictograms and sorting circles 	<p>Living Non-living Compare Same Different Reproduce Grow Growth Young Unhealthy Healthy Germs</p>



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<p>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>	<ul style="list-style-type: none"> - Make measurements using non-standard units - Talks about their findings using everyday terms, text scaffolds or simple scientific language - Use simple observable features to compare objects, materials and living things - Talk about what they have found out and how they found it out - Use comparative language to describe changes, patterns and relationships 	<p>Materials Manufactured Man-made Natural Properties Group</p>
<p>Assessment – RAG rate and note particular children - +</p>		



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Key Stage 2

Year 3

Year 3		
Knowledge	Skills	Vocabulary
<p>Plants</p> <p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</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>	<ul style="list-style-type: none"> - Begin to make decisions about what observations to make and how long to make them for - With support, begin to choose the type of simple equipment that might be used from a reasonable range - Recognise when a simple fair test is needed - With adult guidance, decide how to set up a fair test and control variables - Make systematic and careful observations - Identify differences, similarities or changes related to simple scientific ideas and processes - With support, use results to suggest improvements to what they have done - With support, raise further questions (e.g. arising from the data) - With support, makes predictions for new values within or beyond the data collected 	<p>Root Stem Trunk Leaves Flowers Life Growth Air Light Water Nutrients Soil Transported Cycle Pollination Seed formation Seed dispersal Light Warmth Water</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>	<ul style="list-style-type: none"> - Recognise when and how secondary sources (e.g. books, internet, experts, diagrams) might help answer questions that cannot be answered through practical investigations - Report on findings from enquiries, in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions - Uses straightforward scientific evidence to answer questions - Use relevant scientific language to discuss their ideas and communicate their findings 	<p>Nutrition Food Skeletons Muscles Support Protection Movement Ribs Bones Calcium Classify Connective Tissue Contract Joint Relax Vertebrae Invertebrate</p>



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<p>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>	<ul style="list-style-type: none"> - Make systematic and careful observations - Make accurate measurements using standard units (e.g. cm, m, °C, N, g, Kg, ml) using a range of equipment, e.g. data loggers and thermometers - Record and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables - Use observable and other criteria to group, sort and classify in different ways (including simple keys) 	<p>Physical properties</p> <p>Fossils</p> <p>Soils</p> <p>Rocks</p> <p>Organic matter</p> <p>Strong</p> <p>Weak</p> <p>Flexible</p> <p>Transparent</p> <p>Granite</p> <p>Slate</p> <p>Sandstone</p>
<p>Light</p> <p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that the size of shadows change</p>	<ul style="list-style-type: none"> - Ask relevant questions and start to use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Use appropriate equipment and measurements with reasonable accuracy - Recognise when a simple fair test is needed - With adult guidance, decide how to set up a fair test and control variables - With support, gather and record data in a variety of ways to help in answering questions - With support, make decisions about how to record and analyse the data - With help, look for changes, patterns, and relationships in their data - With help, use results to draw simple conclusions and answers questions using appropriate level of knowledge and their own experiences 	<p>Light</p> <p>Dark</p> <p>Absence of light</p> <p>Reflect</p> <p>Surfaces</p> <p>Shadows</p> <p>Source</p> <p>Opaque</p> <p>Transparent</p>
<p>Assessment – RAG rate and note particular children - +</p>		



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Year 4		
Knowledge	Skills	Vocabulary
<p>Living Things and Their Habitats</p> <p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<ul style="list-style-type: none"> - Recognise when and how secondary sources (e.g. books, internet, experts, diagrams) might help answer questions that cannot be answered through practical investigations - Record and present findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables - Use observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases) 	<ul style="list-style-type: none"> Classification key Living things Environment Habitat Consumer Food chain Life cycle Nutrition Organism Predator Prey Producer
<p>Animals Including Humans</p> <p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>	<ul style="list-style-type: none"> - Identify differences, similarities or changes related to simple scientific ideas and processes - Use relevant scientific language to discuss their ideas and communicate their findings 	<ul style="list-style-type: none"> Digestive system Teeth Food chains Producers Predators Prey
<p>States of Matter</p> <p>Compare and group materials together, according to whether they are solids, liquids or 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</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<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 - Begin to make decisions about what observations to make and how long to make them for - Begin to choose the type of simple equipment that might be used from a reasonable range - Use appropriate equipment and measurements with reasonable accuracy recognises when a simple fair test is needed - Make accurate measurements using standard units (e.g. cm, m, °C, N, g, Kg, ml) using a range of equipment, e.g. data loggers and thermometers - Gather and records data in a variety of ways to help in answering questions - With support, make predictions for new values within or beyond the data collected 	<ul style="list-style-type: none"> Solid Liquid Melt Freeze Gas Heated Cooled Degrees Celsius Evaporation Condensation Temperature Body temperature Boiling point Freezing Point Insulate Thermal conductor Thermal insulator Thermometer
<p>Sound</p> <p>Identify how sounds are made, associating some of them with something vibrating</p>	<ul style="list-style-type: none"> - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations - Prepare own format for recording data 	<ul style="list-style-type: none"> Vibration Medium Ear Pitch Sound Volume Distance



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<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>	<ul style="list-style-type: none"> - Make decisions about how to record and analyse the data - With support, use results to suggest improvements to what they have done - With support, raise further questions (e.g. arising from the data) 	
<p>Electricity</p> <p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical 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>	<ul style="list-style-type: none"> - Explain the purposes of a variety of scientific and technological developments. - With help, look for changes, patterns, and relationships in their data - With help, use results to draw simple conclusions and answers questions using appropriate level of knowledge and their own experiences - Use straightforward scientific evidence to answer questions or to support their findings 	<p>Electricity</p> <p>Cell</p> <p>Wires</p> <p>Bulbs</p> <p>Switches</p> <p>Buzzers</p> <p>Circuit</p> <p>Loop</p> <p>Battery</p> <p>Simple series circuit</p> <p>Conductors</p> <p>Insulators</p> <p>Metals</p>
<p>Assessment – RAG rate and note particular children - +</p>		



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Year 5

Knowledge	Skills	Vocabulary
<p>Living Thing and Their Habitats Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p>	<ul style="list-style-type: none"> - Recognises which secondary sources will be most useful to research their ideas - Begins to separate opinion from fact - Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 	<p>Life cycle Mammal Amphibian Insect Bird Reproduction Plants Animals Secondary sources Produce Stamen Stigma</p>
<p>Animals including Humans Describe the changes as humans develop to old age</p>	<ul style="list-style-type: none"> - Recognises which secondary sources will be most useful to research their ideas - Reports on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other presentations 	<p>Lifecycle Sperm Foetus Egg Development Nutrition Uterus Causal relationship Puberty Teenager Adolescent Death Old age</p>
<p>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</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 might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair test, for the particular uses of every day 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>	<ul style="list-style-type: none"> - With support, select and plans different types of scientific enquiries to answer questions - With support, make decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them - Choose the most appropriate equipment to make measurements - Explain how to use the equipment accurately - Recognise when and how to set up comparative and fair tests - Recognise and control variables where necessary (e.g. explains which variables need to be controlled and why) - Takes measurements, in standard units, using a range of scientific equipment, with increasing accuracy and precision - Decides how to record data from a choice of familiar approaches - Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 	<p>Hardness Solubility Transparency Conductivity – electrical and thermal Magnets Dissolve Liquid Solid Gas Mixtures Filtering Sieving Evaporating Comparative test Fair test Metal Wood Plastic Changes of state Reversible changes Irreversible changes Burning Action of acid Evaporate Condense Oxygen Dissolve</p>



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<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' rotation to explain day and night and the apparent movement of the sun across the sky</p>	<ul style="list-style-type: none"> - With guidance from the teacher, talk about how scientific ideas have developed over time - Recognise the applications of specific scientific ideas - Begins to separate opinion from fact 	<p>Planet Earth Sun Solar system Moon Spherical bodies Rotation Day Night Sphere</p>
<p>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>	<ul style="list-style-type: none"> - Choose the most appropriate equipment to make measurements - Explain how to use the equipment accurately - Takes measurements, in standard units, using a range of scientific equipment, with increasing accuracy and precision - Takes repeat readings when appropriate - Records data and results of increasing complexity - Start to use their scientific experiences to explore ideas and raise different types of questions - Calculates mean value where appropriate 	<p>Gravity Falling Air resistance Water resistance Lever Pulley Gears Force effect</p>
<p>Assessment – RAG rate and note particular children - +</p>		



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Year 6

Knowledge/Theme	Skills	Vocabulary
<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 micro-organisms, plants and animals</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p>	<ul style="list-style-type: none"> - Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 	Classified Observable characteristics Similarities Differences Micro-organisms Plants Animals Micro-organism Microbe Germ Virus
<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, exercise, 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>	<ul style="list-style-type: none"> - Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - Identifying scientific evidence that has been used to support or refute ideas or arguments 	Heart Blood vessels Blood Capillaries Atrium Aorta Diet Exercise Drugs Lifestyle Nutrients Balanced diet Fats
<p>Evolution and Inheritance</p> <p>Recognise that living things have changed 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>	<ul style="list-style-type: none"> - Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - Identifying scientific evidence that has been used to support or refute ideas or arguments 	Fossils Offspring Vary Identical Evolution Inheritance Genes Adapt Adaptation



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<p>Light</p> <p>Recognise that light appears to travel in straight lines</p> <p>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>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>	<ul style="list-style-type: none"> - Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - Using test results to make predictions to set up further comparative and fair tests 	<p>Light Straight Reflect Light sources Objects Shadows Opaque Transparent Beam Reflection</p>
<p>Electricity</p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>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</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<ul style="list-style-type: none"> - Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate 	<p>Buzzer Voltage Cells Circuit Bulb Switches Diagram Parallel circuit Simple circuit Complete circuit Conductor Insulator</p>
<p>Assessment – RAG rate and note particular children - +</p>		