



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills



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

#### EYFS - Nursery

Science is taught through 'Understanding the World' which is a specific area. It includes history, RE, science and geography.

There are three areas within 'Understanding the World'

- Past and Present
- People, Culture and Communities
- The Natural World

Understanding the world is part of the investigation station in all EYFS classrooms and is part of continuous provision for children to access

Through various cooking opportunities/experiences, the children will observe melting chocolate, cooking eggs, and observe changes in general cooking (eg. Bread rising or changing texture when adding jam)

<p style="text-align: center;">Autumn</p> <p style="text-align: center;">All About Me Celebrations</p>	<p><u>Walking Through The Jungle/ Non Fiction Books on Wild Animals:</u></p> <ul style="list-style-type: none"> <li>Talk about animals and their habitats from the story.</li> </ul> <p><u>Autumn/Non Fiction Books:</u></p> <ul style="list-style-type: none"> <li>Notice and ask questions about the features of the school woodland during a woodland walk.</li> <li>Look at how the leaves change over time through colour and them falling.</li> </ul> <p><u>Owl Babies:</u></p> <ul style="list-style-type: none"> <li>Go on a senses walk through the woodlands.</li> <li>Talk about Owls and their habitats.</li> </ul>	<p><b>Nature</b></p> <p><b>Plants</b></p> <p><b>Animals</b></p> <p><b>Weather</b></p> <p><b>Grow</b></p> <p><b>Change</b></p> <p><b>See</b></p> <p><b>Hear</b></p> <p><b>Feel</b></p> <p><b>Look</b></p> <p><b>Touch</b></p>
<p style="text-align: center;">Spring</p> <p style="text-align: center;">Around the World</p>	<p><u>Winter/Non Fiction Books:</u></p> <ul style="list-style-type: none"> <li>Look at winter weather and think about what is appropriate to wear</li> <li>Go on a winter woodland walk and look at the changes in the environment</li> </ul> <p><u>Dinosaurs:</u></p> <ul style="list-style-type: none"> <li>Name different dinosaurs</li> </ul> <p><u>Dear Zoo</u></p> <ul style="list-style-type: none"> <li>Name and talk about zoo animals</li> <li>Talk about similarities and differences</li> </ul>	
<p style="text-align: center;">Growing and Changing</p>	<p><u>Oliver's Vegetables</u></p> <ul style="list-style-type: none"> <li>Plant pea seeds and watch them grow and change over time</li> </ul> <p><u>Spring/Non-Fiction Books</u></p> <ul style="list-style-type: none"> <li>Look at spring weather and think about what is appropriate to wear and the changes in temperature.</li> <li>Go on a spring woodland walk and look at the changes in the environment</li> </ul> <p><u>Farmer Duck</u></p> <ul style="list-style-type: none"> <li>Talk about farm animals</li> <li>Engage with the farm visit to school</li> </ul>	



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

	<u>Jasper's Beanstalk</u> <ul style="list-style-type: none"> <li>Plant cress seeds and watch them grow and change over time</li> </ul>	
Summer Let's Investigate	<u>Mad about mini beasts</u> <ul style="list-style-type: none"> <li>Talk about mini-beasts and name some</li> </ul> <u>The Very Hungry Caterpillar</u> <ul style="list-style-type: none"> <li>Observe how caterpillars grow and change into a butterfly</li> <li>Engage and look at real life caterpillars</li> </ul> <u>We're Going on a Bear Hunt</u> <ul style="list-style-type: none"> <li>Talk about bears and their habitats</li> <li>Look at different habitats that appear in the story</li> </ul>	
Let's Tell a Story	<u>Elmer's Weather</u> <ul style="list-style-type: none"> <li>Look at the different types of weather and weather changes</li> </ul> <u>The Three Billy Goat's Gruff</u> <ul style="list-style-type: none"> <li>Talk about goats and their habitats</li> </ul> <u>Toddle Wadle</u> <ul style="list-style-type: none"> <li>Talk about the different types of weather in the story</li> </ul>	

### Assessment

	<p><b>Range 4:</b> Notices detailed features of objects in their environment. Can talk about some of the things they have observed such as plants, animals, natural and found objects. Enjoys playing with small world reconstructions, building on first hand experiences.</p> <p><b>Range 5:</b> Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. Talks about why things happen and how things work. Being to develop an understanding of growth, decay and changes over time. Show care and concern for living things and the environment. Begin to understand the effect their behaviour can have on the environment.</p>
--	--

## EYFS - Reception

Science is taught through 'Understanding the World' which is a specific area. It includes history, RE, science and geography.

There are three areas within 'Understanding the World'

- Past and Present
- People, Culture and Communities
- The Natural World

Understanding the world is part of the investigation station in all EYFS classrooms and is part of continuous provision for children to access throughout the day. We assess each child in 'Understanding the World' every term using Birth to 5 Matters.

Autumn All About Me	<u>The Three little Pigs:</u> <ul style="list-style-type: none"> <li>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</li> <li>Exploring properties of materials- testing the <i>stuff</i> the houses were built from..</li> </ul> <u>Goldilocks and Three Bears</u> <ul style="list-style-type: none"> <li>Exploring temperature of porridge and seeing the process of change.</li> <li>Testing the Chairs (Weight and Force)-Understanding that different materials and structures handle different weights</li> </ul> <u>Stickman</u> <ul style="list-style-type: none"> <li>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.-</li> </ul>	<b>Hot</b> <b>Cold</b> <b>Light</b> <b>Heavy</b> <b>Float</b> <b>Sink</b> <b>Waterproof</b> <b>Rough</b> <b>Smooth</b> <b>Sun</b> <b>Soil</b> <b>Plant</b>
------------------------	---	---



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p style="text-align: center;">People Who Help Us</p>	<p>exploring how we can get stickman to get out of the ice.</p> <ul style="list-style-type: none"> <li>Exploring density by observing which natural materials float or sink (referencing when Stick Man is "carried out to sea").</li> </ul> <p><u>Autumn</u></p> <ul style="list-style-type: none"> <li>Exploring the natural world and gather different types of sticks to make a stickman, strength and flexibility.</li> </ul> <p><u>People who help us</u></p> <ul style="list-style-type: none"> <li>Explore the natural world around them, making observations-testing waterproof materials for the people who help us.</li> </ul> <p><u>Construction workers</u></p> <ul style="list-style-type: none"> <li>Building Strong Structures- Investigating how shape and joining methods affect the strength and stability of a structure.</li> </ul>	
<p style="text-align: center;">Spring Barnaby's Bear Travels (fantasy)</p> <p style="text-align: center;">Growing and Changing</p>	<p><u>Dinosaurs</u></p> <ul style="list-style-type: none"> <li>Understanding some important processes and changes in the natural world around them, including changing states of matter- understanding that fossils are found buried in the ground and require careful digging.</li> <li>Explore the natural world around them, making observations. Understanding how footprints and skin leave imprints (trace fossils) in soft mud using clay.</li> </ul> <p><u>Pirates – Pirates Love Underpants</u></p> <ul style="list-style-type: none"> <li>Exploring different materials to create a boat and investigate which one sinks and floats and why.</li> </ul> <p><u>Space – Whatever Next</u></p> <ul style="list-style-type: none"> <li>Observing phenomena and changes. Shine the torch onto the ball and encourage children to move the ball to observe how the <b>shadow</b> moves and changes size and shape.</li> </ul> <p><u>Castles – Rapunzel</u></p> <ul style="list-style-type: none"> <li>Building the Strongest Wall- Investigating which materials provide the best stability and strength for building tall castle structures.</li> </ul> <p><u>Superheroes – Supertato, Bubbly Trouble</u></p> <ul style="list-style-type: none"> <li>Exploring Forces and Movement- create a ramp (a piece of wood or cardboard) for the superheroes.</li> </ul> <p><u>Spring and new life – Monkey Puzzle</u></p> <ul style="list-style-type: none"> <li>Explore the natural world around them, planting a bean and making observations and drawing pictures of the life cycle.</li> </ul> <p><u>Farm animals – What the Ladybird Heard Next</u></p> <p><u>Easter</u></p> <ul style="list-style-type: none"> <li>Observing the process of life and growth in hatching eggs.</li> </ul> <p><u>Healthy Eating – Handa's Surprise</u></p> <ul style="list-style-type: none"> <li>Understand some important processes and changes in the natural world around them- How does an apple begin to go rotten.</li> </ul>	
<p style="text-align: center;">Summer Let's Investigate</p> <p style="text-align: center;">All Around the World</p>	<p><u>Mini beasts</u></p> <ul style="list-style-type: none"> <li>Observing and investigating the environment mini beasts prefer creating a mini beast hotel.</li> </ul> <p><u>The Hungry Caterpillar</u></p> <ul style="list-style-type: none"> <li>Observing and investigating the concept of change over time and the caterpillar's life stages.</li> </ul> <p><u>Under the sea- Commotion in the Ocean</u></p> <ul style="list-style-type: none"> <li>Exploring the natural world around them, making observations and drawing pictures of sea animals- sorting based on physical characteristics (number of legs/arms, shell, no legs).</li> </ul> <p><u>Around the world</u></p> <ul style="list-style-type: none"> <li>Knowing some similarities and differences between weathers around the world. Freezing and melting observation.</li> </ul> <p><u>Elmer</u></p> <ul style="list-style-type: none"> <li>Colour science and observation of how materials mix.</li> </ul> <p><u>The naughty bus</u></p> <ul style="list-style-type: none"> <li>Measure how far different sized vehicles would go down a ramp.</li> </ul>	



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

### Assessment

EXS	Explore the natural world around them, making observations and drawing pictures of animals and plants.
ELG	Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter

### Key Stage 1

Year 1		
Knowledge	Skills	Vocabulary
<p><b>Plants</b> 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>	<p>Identify and classify (sort and group objects)</p> <p>With help, record findings in a range of ways, e.g. simple tables, diagrams, pictograms and sorting circles</p> <p>Use simple observable features to compare objects, materials and living things</p> <p><b><u>Scientist to study:</u></b> Briefly mention Carl Linnaeus (naming and classifying)</p>	<p>Deciduous Evergreen Bulb Seeds Seedling Stem Flower Blossom Petals Leaves Fruit Branch Root Trunk Leaves Bud</p>
<p><b>Animals including humans</b> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (describe and compare the structure of these).</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Identify name, draw and label the basic parts of the human body and say which part of the body is associated with which sense.</p>	<p>Identify and classify (sort and group objects)</p> <p>Group animals according to what they eat.</p> <p>With help, record findings in a range of ways, e.g. simple tables, diagrams, pictograms and sorting circles</p> <p>Use simple observable features to compare objects, materials and living things</p>	<p>Pet Tame Wild Carnivore Herbivore Omnivore Mammals Fish Amphibians Reptiles Bird Various animal and dinosaur names Taste Smell Vision/see Touch Hear</p>
<p><b>Everyday Materials</b> 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>Uses simple secondary sources to find answers, e.g. books, videos, photographs or people.</p> <p>Gather and record simple data.</p> <p>Talk about their findings using everyday terms, text scaffolds or simple scientific language.</p> <p>Use simple observable features to compare objects, materials and living things.</p> <p><b><u>Scientists to study:</u></b> Charles Macintosh (waterproof fabric)</p>	<p>Materials Manufactured Man-made Natural Wood Plastic Properties Group Glass Metal Water Rock Stretchy Shiny Dull Waterproof Absorbent Fabric</p>



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p><b>Seasonal Changes</b> Observe changes across the four seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>	<p>Ask simple questions and recognise that questions can be answered in different ways.</p> <p>Use simple measurements and equipment to gather data.</p> <p>Observe closely (including changes over time), using simple equipment.</p> <p>Talk about what they have found out and how they found it out.</p>	<p>Seasons Spring Summer Winter Autumn Weather Day Length</p> <p>Snow Hail Sleet Fog</p>
--	--	--

Year 2		
Knowledge	Skills	Vocabulary
<p><b>Living things and their habitats</b> 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. 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. Identify and name different sources of food.</p>	<p>Use simple secondary sources to find answers, e.g. books, videos, photographs or people.</p> <p>Gather and record simple data.</p> <p>With help, record findings in a range of ways, e.g. simple tables, diagrams, pictograms and sorting circles.</p> <p>Use simple observable features to compare objects, materials and living things.</p>	<p>Living Alive Non-living Dead Habitats Food source Food chain Shelter Seashore Woodland Ocean Rainforest Desert Conditions Damp Dry Bright Shade Dark Micro-habitat</p>
<p><b>Plants</b> 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>Ask simple questions and recognise that they can be answered in different ways.</p> <p>Perform simple tests by following the teacher's instructions.</p> <p>With guidance, suggest what they will do next. Use resources provided or chosen from a limited range.</p> <p>With guidance from the teacher, suggest why a test is unfair.</p> <p>Use observations and ideas to suggest answers to questions.</p> <p>With support, suggest whether or not what happened was what they expected. With support, suggest different ways they could have done things.</p>	<p>Seed dispersal Germinate Produce Reproduce Growth Survival</p>



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p><b>Animals including Humans</b> 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 (and different types) food and hygiene.</p>	<p>Uses simple secondary sources to find answers, e.g. books, videos, photographs or people.</p> <p>Gathers and records simple data.</p> <p>With help, record findings in a range of ways, e.g. simple tables, diagrams, pictograms and sorting circles.</p> <p><b>Scientist to study:</b> Maria Sibylla Merian (butterflies, moths caterpillars)</p>	<p>Offspring Young Change Compare Living Similar Different Teenager Adult Healthy Unhealthy air balanced diet exercise muscles strength flexibility fitness hygiene cleanliness</p>
<p><b>Materials</b> 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>Make measurements using non-standard units.</p> <p>Talk about their findings using everyday terms, text scaffolds or simple scientific language.</p> <p>Use simple observable features to compare objects, materials and living things.</p> <p>Talk about what they have found out and how they found it out.</p> <p>Use comparative language to describe changes, patterns and relationships.</p> <p><b>Scientists to study:</b> John Dunlop</p>	<p>Manufactured Natural Properties Grouping Squashing Squash Twist Stretch Examples of different materials</p>

### Lower Key Stage 2

Year 3		
Knowledge	Skills	Vocabulary
<p><b>Plants</b> 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>	<p>Begin to make decisions about what observations to make and how long to make them for.</p> <p>With support, begin to choose the type of simple equipment that might be used from a reasonable range.</p> <p>Recognise when a simple fair test is needed. With adult guidance, decide how to set up a fair test and control variables</p> <p>Make systematic and careful observations.</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>With support, use results to suggest improvements to what they have done. With support, raise further questions (e.g. arising from the data)</p> <p>With support, makes predictions for new values within or beyond the data collected.</p>	<p>Nutrients Transported fertiliser Seed dispersal Pollination Seed formation</p>



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p><b>Animals Including Humans</b> 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>Recognise when and how secondary sources (e.g., books, internet, experts, diagrams) might help to answer questions that cannot be answered through practical investigations.</p> <p>Report on findings from enquiries in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions.</p> <p>Uses straightforward scientific evidence to answer questions.</p> <p>Use relevant scientific language to discuss their ideas and communicate their findings.</p>	<p>Nutrition Calcium bones Skeletons Muscles Support Protection Movement Tissue Joint Vertebrae Invertebrate</p>
<p><b>Rocks</b> 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>Make systematic and careful observations.</p> <p>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.</p> <p>Record and present findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables.</p> <p>Use observable and other criteria to group, sort and classify in different ways (including simple keys).</p>	<p>Rocks Igneous Sedimentary metamorphic Granite Slate Sandstone Appearance Grains Crystals Fossils Organic matter Sub soil Base rock</p>
<p><b>Light</b> Recognise that light is needed 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>	<p>Ask relevant questions and start to use different types of scientific enquiries to answer them.</p> <p>Set up simple practical enquiries, comparative and fair tests.</p> <p>Use appropriate equipment and measurements with reasonable accuracy.</p> <p>Recognise when a simple fair test is needed.</p> <p>With adult guidance, decide how to set up a fair test and control variables.</p> <p>With support, gather and record data in a variety of ways to help in answering questions.</p> <p>With support, make decisions about how to record and analyse the data.</p> <p>With help, look for changes, patterns, and relationships in their data.</p> <p>With help, use results to draw simple conclusions and answers questions using an appropriate level of knowledge and their own experiences.</p>	<p>Light Dark Source Natural Artificial Reflect Reflection Periscope Safety Shadows Opaque Transparent Blocked</p>



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p><b>Forces and magnets</b></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 and attract some materials and not others.</p> <p>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.</p> <p>Describe magnets as having 2 poles.</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary.</p> <p>Explore the behaviour and everyday uses of different magnets.</p> <p>Compare how different things move and to group them.</p> <p>Raise questions and carry out tests to find out how far things move on different surfaces.</p> <p>Gather and record data to find answers to enquiry questions.</p> <p>Explore the strengths of different magnets and find a fair way to compare them.</p> <p>Look for patterns in the way that magnets behave in relation to each other and what might affect this.</p> <p>Identify how these properties make magnets useful in everyday items and suggest creative uses for different magnets.</p>	<p>Forces</p> <p>Push</p> <p>Pull</p> <p>Surfaces</p> <p>Friction</p> <p>texture</p> <p>Magnets</p> <p>Pole</p> <p>Magnet</p> <p>Magnetic</p> <p>Attract</p> <p>Repel</p> <p>Distance</p> <p>Contact</p> <p>Fair test</p> <p>North Pole</p> <p>South Pole</p>
---	--	---

Year 4		
Knowledge	Skills	Vocabulary
<p><b>Living things and their habitats</b></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>	<p>Recognise when and how secondary sources (e.g. books, internet, experts, diagrams) might help answer questions that cannot be answered through practical investigations.</p> <p>Record and present findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables.</p> <p>Use observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases).</p>	<p>Characteristics</p> <p>Classification key</p> <p>Producer</p> <p>Food chain</p> <p>Predator</p> <p>Prey</p> <p>Pests</p> <p>Consumer</p> <p>Organism</p> <p>Population</p> <p>Environmental impact</p>
<p><b>Animals Including Humans</b></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>	<p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Use relevant scientific language to discuss their ideas and communicate their findings.</p>	<p>Digestive system</p> <p>Digestion</p> <p>Saliva</p> <p>Oesophagus</p> <p>Stomach</p> <p>Enzymes</p> <p>faeces</p> <p>Incisors</p> <p>Canines</p> <p>Molars</p> <p>Ripping</p> <p>Tearing</p> <p>Over population</p> <p>Decline</p>



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p><b>States of Matter</b> 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.</p> <p>Measure or research the temperature at which heating and cooling happens in degrees Celsius.</p> <p>Identify the part played by evaporation and condensation in the water cycle.</p> <p>Associate the rate of evaporation with temperature.</p>	<p>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.</p> <p>Begin to choose the type of simple equipment that might be used from a reasonable range. Use appropriate equipment and measurements with reasonable accuracy.</p> <p>Recognise when a simple fair test is needed.</p> <p>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.</p> <p>Gather and record data in a variety of ways to help in answering questions. With support, make predictions for new values within or beyond the data collected.</p>	<p>Solid Liquid Melt Gas Melt Heated Temperature Degrees Celsius Fahrenheit Insulate Thermometer Freeze Cooled Evaporation Condensation Freezing Point</p>
<p><b>Electricity</b> 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 bulb will light in a simple series circuit, based on whether or not the bulb 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 bulb lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>Explain the purposes of a variety of scientific and technological developments.</p> <p>With help, look for changes, patterns, and relationships in their data.</p> <p>With help, use results to draw simple conclusions and answers questions using appropriate level of knowledge and their own experiences.</p> <p>Use straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Electricity Appliances Buzzer Cell Battery Wire Circuit Switch Open Conductors Insulators</p>

### Upper Key Stage 2

## Year 5

Knowledge	Skills	Vocabulary
<p><b>Living things and their habitats</b> 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>	<p>Recognises which secondary sources will be most useful to research their ideas.</p> <p>Begins to separate opinion from fact.</p> <p>Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p><b>Scientists to study:</b> David Attenborough and Jane Goodall</p>	<p>Sexual reproduction Asexual reproduction (plants) Stamen Stigma naturalist</p>



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p><b>Animals including Humans</b> Describe the changes as humans develop to old age.</p>	<p>Recognises which secondary sources will be most useful to research their ideas.</p> <p>Reports on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other presentations.</p>	<p>Puberty Adolescent Sperm Foetus Egg Uterus Gestation</p>
<p><b>Properties and Changes of Materials</b> 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 tests, for the 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>With support, select and plans different types of scientific enquiries to answer questions.</p> <p>With support, make decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them.</p> <p>Choose the most appropriate equipment to make measurements.</p> <p>Explain how to use the equipment accurately.</p> <p>Recognise when and how to set up comparative and fair tests.</p> <p>Recognise and control variables where necessary (e.g. explains which variables need to be controlled and why).</p> <p>Takes measurements in standard units, using a range of scientific equipment with increasing accuracy and precision.</p> <p>Decides how to record data from a choice of familiar approaches.</p> <p>Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p><b>Scientists to study:</b> Spencer Silver Ruth Benerito</p>	<p>Hardness Transparency Conductivity – electrical and thermal Filtering Sieving Dissolve Solution Soluble Insoluble Variable Reversible Irreversible</p>
<p><b>Earth and Space</b> 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>With guidance from the teacher, talk about how scientific ideas have developed over time.</p> <p>Recognise the applications of specific scientific ideas.</p> <p>Begins to separate opinion from fact.</p> <p><b>Scientists to study:</b> Mary Somerville Maggie Aderin-Pocock Nicolaus Copernicus Ptolemy Alhazen</p>	<p>Planet + planet names Earth Sun Solar system Moon Spherical bodies Rotation Day geocentric Night heliocentric Sphere/spherical Celestial body Axis Rotate Hemisphere Astronomer (including names of) Eclipse Satellite</p>



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p><b>Forces</b></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>Choose the most appropriate equipment to make measurements.</p> <p>Explain how to use the equipment accurately.</p> <p>Take measurements in standard units, using a range of scientific equipment, with increasing accuracy and precision.</p> <p>Takes repeat readings when appropriate. Calculates mean value where appropriate.</p> <p>Records data and results of increasing complexity.</p> <p>Start to use their scientific experiences to explore ideas and raise different types of questions.</p> <p><b>Scientists to study:</b> Galileo Galilei Isaac Newton</p>	<p>Gravity Air resistance Water resistance Accelerate Lever Pulley Gears Mechanism</p>
---	---	--

### Year 6

Knowledge	Skills	Vocabulary
<p><b>Living things and their habitats</b></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>	<p>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.</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><b>Scientists to study:</b> Carl Linnaeus</p>	<p>Classified Observable characteristics Similarities Differences Micro-organisms Plants Animals Micro-organism Microbe Germ Virus</p>
<p><b>Animals Including Humans</b></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>	<p>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.</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>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p><b>Scientists to study:</b> Elsie Widdowson</p>	<p>Organs Heart Kidneys lungs Blood vessels Capillaries Veins Arteries Blood flow Lifestyle Impact Damage</p>



# BEECHFIELD SCHOOL

## Science Progression of Knowledge and Skills

<p><b>Evolution and Inheritance</b></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>	<p>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.</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>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p><b><u>Scientists to study:</u></b>            Mary Anning            Charles Darwin            Alfred Russel Wallace</p>	<p>Evolution            Variation            Conditions            Adapt            Adaptation            Offspring            Characteristics            Inheritance            Identical            Non identical            Genes</p>
<p><b>Light</b></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>	<p>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</p> <p>Using test results to make predictions to set up further comparative and fair tests.</p> <p><b><u>Scientists to study:</u></b>            Alhazen (Ibn al-Haytham)            Ptolemy</p>	<p>Refraction            Beam            pixels</p>
<p><b>Electricity</b></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>	<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>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.</p> <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p>	<p>Static            current            Voltage            Simple circuit            Parallel circuit</p>