Finham Primary School

Sustainability Units in Green

Science: Curriculum Overview

Science						
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Nursery	- Talk about the clothes you might need to wear in certain weathers. - Explore toys with cogs, latches, magnetic tiles and talk about how they work. - Talk about what they see, smell, hear, taste, touch. - Name animals and know what sound they make.		- Talk about some things that plants need to survive e.g. water. - Can tell you what seasons you would need to wear a sun hat, woolly hat etc... - Can care for a seed they have planted. - Has caterpillars and watches them grown and change; talk about the life cycle of a butterfly.		- Talk about the differences in materials. - Name their five senses (may need some reminding). - Explore the push and pull force. - Talk name some of the seasons.	
Reception	- Explores magnets. - Talks about changes in seasons. Can talk about how and when things grow. (this will be done in each season). - Can order the seasons.		- Simply explores Gravity (simple experiment). - Can show respect to the environment and shows care and concern for living things.		- Begin to discuss (as a class) human and physical change in the world around them. - Can talk about their five senses. - Can talk about the word around them (both local and outside the U.K). - Can talk about simple life cycles. - Can name what plants need to survive and can explain why.	

Year 1	**Working Scientifically** 1. Ask simple questions and recognise that they can be answered in different ways. 2. Observe closely, using simple equipment. 3. Perform simple tests. 4. Identify and classify. 5. Use their observations and ideas to suggest answers to questions. 6. Gather and record data to help in answering questions.				
	Seasons (1) (Biology) - Understand when each of the four seasons occurs - Identify the features of autumn are and what happens to trees in this season - Investigate why days are longer in summer (sunshine hours) than in winter - Observe changes across the four seasons	**Animals including humans** (Biology) - Identify and name a range of common animals from the local and wider environment. - Classify and sort familiar animals according to whether they are invertebrates, fish, amphibians, reptiles, birds or mammals. - Name animals living in a range of familiar environments, such as their homes, woodland or school grounds.	**Plants** (Biology) - Identify and name a variety of common wild and garden plants found growing in the locality. - Sort trees into groups to show those that are evergreen and those that are deciduous. - Identify the basic structural parts of common flowering plants and trees, including root, stem, stalk, leaves, flowers, bulb, fruit, seeds and trunk. - Care for a growing seedling, observing	**Everyday Materials** (Chemistry) - Name a range of everyday materials, including wood, plastic, metal, rock and glass. - Distinguish between an object and the material from which it is made. - Identify the material an object is made from, suggesting why it is made from that material. - Describe simple, physical properties of a material using everyday language or simple scientific vocabulary (e.g. hard/soft or bendy/not bendy). - Group and sort materials according to their simple physical properties. - Identify some materials that help physical processes (e.g. woollen fabric keeps us warm). - Compare two or more different materials for their performance at a particular task (e.g. mopping up a spill).	**Seasons (2)** (Biology) - Describe weather in different seasons over a year. - Describe the features of different seasons and how they change through the year

		- Identify whether an animal is a carnivore, herbivore or omnivore and how we might know this from their physical appearance. - Draw and label basic parts of the human body, including those related to the senses. - Compare animals that are kept as pets, knowing which group they belong to. - Describe and compare the structure of a variety of common animals.	and describing its growth. - Identify the seeds, as a part of a plant, that makes a whole new plant. - Describe how plants change over time, including seasonal change (leaves fall off, blossom, buds opening). - Name, compare and contrast familiar plants according to their observable features. **Growing and Cooking** - Identify where food is grown - Grow their own food (potatoes) and monitor changes	**Caring for our Planet** - Identify ways in which we can help protect our environment - Understand why caring for our environment is important	

Year 2	**Working Scientifically** 1. Ask simple questions and recognise that they can be answered in different ways. 2. Observe closely, using simple equipment. 3. Perform simple tests. 4. Identify and classify. 5. Use their observations and ideas to suggest answers to questions. 6. Gather and record data to help in answering questions.		
	Animals and Living Things and their Habitats (Biology) - Sort and classify things according to whether they are dead, alive or have never been alive - Name a variety of different plants and animals, both native and non-native - Define the terms 'habitat' and 'micro-habitat', giving examples of animals that live in each place. - Compare the living things in familiar habitats with the living things in a less familiar habitat. - Explain how plants and animals are suited to their habitats and give examples of plants and animals that are growing in different habitats. - Describe how animals get their food from other animals and/or plants - Identify what eats plants as a food source and recognise simple food chains. - Construct a simple food chain that includes humans as the top consumer. **Wildlife**	**Plants** (Biology) - Describe how plants grow, identifying what a plant needs for healthy growth and survival. - Recognise that plants produce seeds in order to reproduce and generate new plants. - Describe the main changes as seeds and bulbs grow into mature plants. - Describe how bulbs help plants to grow in winter. - Make comparisons between seeds or bulbs grown in different conditions (e.g. with and without light or water).	**Uses of Everyday Materials** (Chemistry) - Identify the uses of everyday materials in a familiar location (e.g. school or home), recording their findings. - Sort and grade a range of materials for a specific property (e.g. smoothness). - Identify and describe the range of materials that can be used to make a single given object (e.g. cup, chair, table or shelter). - Describe how the shape of some materials can be changed by twisting, bending, squashing or stretching. - Relate a material's physical properties to its uses (e.g. describe or demonstrate how a material can be unsuitable for a given task due to its ability to be changed by squashing and bending). - Compare significant individuals who have developed useful materials (e.g. Charles Macintosh or John Dunlop) and decide which individual's material is of most use to them.

	- Understand what wildlife does for us - Identify ways in which we can protect wildlife		**Plastic** - Understand that plastic can be both helpful and harmful and identify the reasons for this - Identify ways in which the school could reduce its plastic consumption

Year 3	**Working Scientifically** 1. Ask relevant questions and use different types of scientific enquiries to answer them. 2. Set up simple practical enquiries, comparative and fair tests. 3. Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 4. Gather, record, classify and present data in a variety of ways to help in answering questions. 5. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. 6. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. 7. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. 8. Identify differences, similarities or changes related to simple scientific ideas and processes. 9. Use straightforward scientific evidence to answer questions or to support their findings				
	Plants (Biology) - Identify and describe the functions of common flowering plant parts (roots; stem/trunk, leave and flowers). - Explain how their structure is suited to their function (e.g. roots are long and branched to provide good anchorage). - Draw a simple diagram to show how water is transported through a plant.	**Rocks and Fossils** (Chemistry) - Identify and name a range of rocks and soils. - Investigate the physical properties of one or a number of rock types and relate their properties to their appearance. - Classify and group rocks according to their appearance or physical properties, using a hand lens or digital microscope and identifying whether they are	**Animals including humans** (Biology) - Identify some of the most important bones in animals such as skull, ribs and spine, describing their primary functions. - Describe how the skeleton and muscles work together to support, protect and assist movement. - Classify and group animals into vertebrates or invertebrates. - Know that animals, including humans, cannot make their own food, by investigating food chains and recognise that all food begins with a plant. - Describe how each of the main food groups specifically benefit the human body for growth and health.	**Light** (Physics) - Recognise that dark is the absence of light and describe how light behaves. - Classify a range of objects as either light sources or light reflectors. - Identify that light is reflected from surfaces, using equipment such as mirrors to demonstrate. - Explain that when a light source is blocked a shadow is formed.	**Forces and Magnets** (Physics) - Describe forces in action (pulling and pushing) and whether the force requires direct contact between objects or whether the force can act at distance (magnetic force). - Explain the terms ‘magnetic attraction’ and ‘repulsion’ and ‘magnetic poles’, using a model for assistance.

	- Order pictures showing the stages in the life cycle of a plant. - Compare and describe how requirements for growth vary from plant to plant and how this relates to a plant's environment, such as with climbing and alpine plants - Recognise that plants make their own food necessary for growth and survival, storing it in their leaves. - Compare and explain the effect of different factors on plant growth, including light and nutrition. - Sort and classify a range of seeds into broad dispersal methods, such as wind (dandelion), water (coconut) or animal (yew). **Biodiversity** - Understand what is meant by the term biodiversity	granular, crystalline or fossilised. - Suggest reasons why certain rocks or stones are used for a specific purpose. - Compare in detail a range of rock or soil samples from the locality, using simple tables and diagrams to present their findings. - Recognise that soils are made from rocks and organic matter. - Explain the terms 'weathering' and 'erosion' and describe the effect they have on different types of rocks and soils. - Identify a range of fossilised animals and plants from pictures. - Define what a fossil is and how they are formed.	- Identify the different food groups and design a healthy meal based on these food groups. - Compare the diets of a herbivore and carnivore with (typically) omnivorous humans. **Food Waste** - Understand what is meant by food waste - Understand ways in which food waste can be minimised.	- Compare how the size, shape and sharpness of shadows can change, using equipment or models. - Recognise that light from the Sun is damaging for vision and the skin, and how we can protect ourselves.	- Sort and group materials into those that are magnetic and those that are not and identify patterns within the groups. - Identify some magnetic and non-magnetic materials and identify patterns within this. - Predict whether two magnets will attract or repel each other depending on which poles are facing. - Make predictions, explaining thinking then test a range of magnets for their strength and polarity. - Compare how an object moves over surfaces made from different materials, making predictions and measuring the distance travelled.

	- Brainstorm ways in which biodiversity could be improved in the local area				

Year 4	**Working Scientifically** 1. Ask relevant questions and use different types of scientific enquiries to answer them. 2. Set up simple practical enquiries, comparative and fair tests. 3. Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 4. Gather, record, classify and present data in a variety of ways to help in answering questions. 5. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. 6. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. 7. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. 8. Identify differences, similarities or changes related to simple scientific ideas and processes. 9. Use straightforward scientific evidence to answer questions or to support their findings				
	Animals and humans (Biology) - Identify, producers, predators and prey in a given food chain and define the terms. - Construct a variety of food chains and explain what would happen if one of the parts of the chain became 'unavailable'. - Identify the different types of teeth and their functions, including how these vary from animal to	**Electricity** (Physics) - Identify and name a range of devices and equipment that require electricity for power. - Construct operational simple series circuits, using a range of components and switches for control, and use these to make simple devices. - Identify and name the basic parts of a circuit.	**States of Matter** (Chemistry) - Describe the properties of solids, liquids and gases, giving examples of each (e.g. solids retain their shape). - Classify everyday materials as a solid, liquid or gas at room temperature. - Measure or research the temperature, in degrees Celsius (°C), at which materials change	**Sound** (Physics) - Listen to and be able to identify a variety of familiar sounds and what is vibrating in each case. - Describe how sound travels through a medium to the outer ear and how sound is transferred to the inner ear. - Describe and demonstrate how the volume or pitch of a sound can be altered, using a range of	**Living things and their habitats** (Biology) - 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. - Develop own classification keys and assign living things to groups, using their keys. - Identify and name a variety of plants in the local and a contrasting environment from their physical appearance. - Use classification keys to classify plants into groups, such as flowering or non-flowering plants.

	animal and animal to human. - Identify different foods that can affect the health of teeth and know the importance of good oral hygiene. - Identify body parts associated with the digestive system, such as mouth, tongue, teeth, oesophagus, stomach and intestine and describe their special functions.	- Predict if a circuit will work based on whether it is a complete loop and draw simple circuits, using circuit symbols. - Recognise that a cell (battery) is a power source, generating and pushing current (electricity) through a circuit, and by adding cells the power source increases. - Recognise the dangers of working with electricity and explain how to work safely. - Sort and classify materials into those that are conductors and those that are insulators, and associate metals with being good conductors. **Energy** - What is energy? - How can we reduce our energy usage?	state and compare to the temperatures at which water changes state. - Identify how water changes state, using the correct terminology and relate these key processes to the water cycle. - Identify the part played by evaporation and condensation in the water cycle. - Associate the rate of evaporation with temperature	equipment such as musical instruments. - Investigate and classify materials for their ability to insulate against sound. - 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. - Measure and compare the volume of a sound at different distances from its source, using appropriate equipment. - Recognise that certain sounds can be damaging for hearing and identify ways in which the ear can be protected.	- Explain how humans can impact on a plant's environment in both positive and negative ways, giving examples from their locality. **Deforestation** - What is deforestation? - What is the impact of deforestation in the UK and the rest of the world?

<table>
<tr><td rowspan="2">Year 5</td><td colspan="5"><u>Working Scientifically</u>

1. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
2. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
3. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
4. 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.
5. Use test results to make predictions to set up further comparative and fair tests.
6. Identify scientific evidence that has been used to support or refute ideas or arguments.</td></tr>
<tr><td>Earth and Space
(Physics)

- Name the eight planets of the solar system and describe their position and movement relative to the Sun and neighbouring planets.
- Describe what a moon is, and how they maintain an orbit around a planet.
- Describe the key force responsible for planets being approximately spherical.
- Explain day and night using the Earth’s rotation, correct terminology and a model if required.</td><td>Forces
(Physics)

- Identify and define the opposing forces that act upon objects moving through air, water or along a surface (air resistance, water resistance and friction).
- Describe the force of gravity, what causes it and how the force of gravity changes (e.g. if we were standing on a different planet)
- Use study skills to research the work of scientists such as Galileo and Newton.</td><td>Properties and changes of materials
(Chemistry)

- 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.
- Provide evidence and reasons why a material has been chosen for a specific use. Scientifically and systematically compare the functionality of a range of materials to perform a specific function.
- Identify a wide range of reversible and irreversible changes that are in use in everyday life.
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- Classify and group mixtures for how they can be separated, including sieving, filtering and evaporating.</td><td>Living things and their habitats
(Biology)

- Draw the life cycle of an insect, an amphibian, a bird and a mammal, highlighting the key differences and similarities.
- Research the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.
- Identify the key structures involved in plant sexual reproduction.
- Classify plant types according to how they reproduce.</td><td>Animals including humans
(Biology)

- Identify, and present in an appropriate way, the key stages in human growth and development from birth to old age.
- Describe the key physical changes in the male and female human body during puberty.
- Compare key facts about mammalian gestation compared to the mass of the animal and suggest reasons for variation within a species (e.g. typical gestation in humans being</td></tr>
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	- Explain how the Earth's 'position' affects day length. - Investigate shadows in relation to times of day and explain why the Sun appears to move across the sky. **Global Warming** - Understand what Global Warming is - Understand the impact of Global Warming on living things	- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. - Demonstrate, using a model, how simple levers, gears and pulleys allow a smaller force to have a greater effect. - Make predictions, supported by scientific reasoning to test the effects of friction on movement and distance travelled. - Compare the speed with which objects of different shapes and surface area fall through the air or water and explain the reason for any differences in terms of the forces acting on the objects.	- Describe what happens when a solute dissolves in a solvent to form a solution and how this process can be reversed. - 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. - Compare reversible with irreversible change, using flow diagrams/equations to show which materials are added, what is made and indicating if the reaction can be reversed. **Plastic Pollution** - Understand what plastic pollution is - Understand the impact of plastic pollution on the planet	- Explain why plants have flowers and why it is important for them to attract insects and other pollinators. - Describe features of flowers, such as scent, colour, shape and size, and how they have evolved to ensure successful pollination. - Describe the different ways in which new plants can be grown from the parent plant, including seeds, bulbs, tubers, cuttings and grafting. - Describe the process of plant reproduction using the correct scientific language. - Make comparisons between asexual and sexual reproduction in plants, suggesting reasons why plants may reproduce in different ways.	between 37-42 weeks).

Year 6	**Working Scientifically** 1. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. 2. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. 3. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. 4. 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. 5. Use test results to make predictions to set up further comparative and fair tests. 6. Identify scientific evidence that has been used to support or refute ideas or arguments.				
	Light (Physics) - Identify parts of the eye and draw a diagram showing how light enters our eyes to see, using the correct scientific vocabulary. - Explain that objects are seen because they give out or reflect light into the eye. - Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.	**Animals including humans** (Biology) - Identify the major parts of the human circulatory system (the heart, blood vessels and blood) and their functions. - Recognise and describe the damaging impact that some drugs and other substances can have on the human body. - Explain how nutrients and water are transported within humans and animals. - Describe how lifestyle is important for the health of the human	**Living things and their habitats** (Biology) - Identify the conditions required for life by both plants and animals. - Recognise the importance of the classification system and its inception, giving reasons for how the groups and subgroups are chosen, focusing on the work of Carl Linnaeus. - Devise classification keys to identify plants in the immediate environment and give reasons for these classifications.	**Evolution and Inheritance** (Biology) - Identify features which are inherited from parents, such as eye colour and those that are not, such as tattoos and dyed hair colour. - Match offspring to their parents, linked to observable features and characteristics. - Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.	**Electricity** (Physics) - Identify and name components of a circuit and define terms, such as voltage and current in relation to series circuits. - Work scientifically to construct a series circuit for a specific device or outcome and explain how it works. - Identify complete and incomplete circuits and relate this to the flow of the current within the circuit. - Draw a series circuit, using the conventional circuit symbols. - Investigate the relationship between the number of cells or voltage of a cell or cells and the effect it has on a bulb or buzzer for example. - 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 **Renewable energy**

	- Explain how light behaves and travels in straight lines. - Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. - Describe how white light can be split using prisms and droplets of water and what colours white light is made from. - Compare how a beam of light changes direction (refraction) when passing through different mediums, such as water and air. **Light Pollution** - To understand what light pollution is	circulatory system, contributing towards a class policy on exercise and diet choices. - Compare scientifically the effect that different exercises have on heart rate, making predictions and measuring heart rate accurately.	- Consider broad groupings of animals, such as vertebrates and invertebrates, and how these can be sub-categorised to help scientists understand how organisms are related to each other. - Define plants in terms of flowering and non-flowering, or deciduous, evergreen and coniferous. - Name the three main groups of microorganism (virus, fungus and bacteria) and identify key identifying features of each, which can help separate them on a classification key.	- Describe how animals must be adapted to their habitats for survival, using a range of animals and their adaptations as examples. - Describe how variation in living things leads to the evolution of a species, using specific examples. - Research the work of Darwin or Wallace to explain how the theory of evolution developed. - Describe how plants have adapted and ultimately evolved to suit their environments using specific examples. - Identify how specific plants or animals have adapted to their environment.	- Understand what is meant by renewable energy - Understand how renewable energy can be used

	- To understand how light pollution can be reduced			- Explain how fossils are formed and how fossil discoveries have helped develop the theory of evolution. - Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. - Research the life and work of Mary Anning and how her discoveries impacted our understanding of evolution.	