

# Hagley Primary School – Progression in Science



Year	NC objectives	
Reception	<p><u>Health and Self-Care</u></p> <ul style="list-style-type: none"> <li>Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep safe and healthy.</li> </ul> <p><u>The World</u></p> <ul style="list-style-type: none"> <li>Children know about similarities and differences in relation to places, objects, materials.</li> </ul> <p><u>Understanding the World</u></p> <ul style="list-style-type: none"> <li>Children make observations of animals and plants and explain why some things occur and talk about changes.</li> <li>Children know about similarities and differences in relation to living things.</li> </ul>	
Year 1	<p><u>Working scientifically (focus on observation and classifying)</u></p> <ul style="list-style-type: none"> <li>Ask simple questions</li> <li>Observe closely using simple equipment</li> <li>Sort scientifically with given criteria and their own categories</li> <li>Use observations and ideas to answer questions</li> <li>Gather and record sorting data to help answer questions</li> <li>Talk about what they have found out, using some scientific vocabulary.</li> </ul> <p><u>Types of enquiry</u></p> <ul style="list-style-type: none"> <li>Classifying and grouping</li> <li>Observing over time</li> <li>Research using secondary sources</li> </ul>	<p><u>Plants</u></p> <ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants. Including deciduous and evergreen trees</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees</li> </ul> <p><u>Animals, in Humans and Plants</u></p> <ul style="list-style-type: none"> <li>Identify and name basic body parts and say which part is associated with which sense</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>Identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals</li> </ul> <p><u>Seasonal Changes (could be done across the year - keep a seasons book)</u></p> <ul style="list-style-type: none"> <li>Observe and describe weather associated with changes of season.</li> <li>Observe changes across the four seasons</li> </ul> <p><u>Everyday Materials</u></p> <ul style="list-style-type: none"> <li>Distinguish between objects and the material it is made from</li> <li>Identify and name common materials, including wood, rock, glass, metal</li> <li>Describe simple properties of everyday materials based on their physical properties</li> <li>Compare and classify materials based on their physical properties</li> </ul>
Year 2	<p><u>Working scientifically (focus on traditional experiment)</u></p> <ul style="list-style-type: none"> <li>Ask simple questions and recognise they can be answered in different ways</li> <li>Observe closely using simple equipment</li> <li>Perform simple tests designed as a class</li> <li>Use observations and ideas to answer questions</li> <li>Gather and record data to help answer questions</li> </ul>	<p><u>Plants</u></p> <ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants</li> <li>Describe and test how plants need water, light and suitable temperature to grow and stay healthy</li> <li>identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> </ul>



	<ul style="list-style-type: none"> <li>Communicate they have found out, using some scientific vocabulary, through discussion and writing.</li> </ul> <p><u>Types of enquiry</u></p> <ul style="list-style-type: none"> <li>Observing over time</li> <li>Research using secondary sources</li> <li>Comparative fair testing</li> <li>Pattern seeking</li> </ul>	<ul style="list-style-type: none"> <li>identify and describe the basic structure of a variety of common flowering plants, including trees</li> </ul> <p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> <li>Explore and compare the differences between things that are living, dead and things that have never been alive</li> <li>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</li> <li>Identify and name a variety of plants and animals in their habitats, including micro-habitats (Y1 previous learning)</li> <li>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. (Y4 learning goes onto producers consumers, predators and prey)</li> </ul> <p><u>Animals including humans</u></p> <ul style="list-style-type: none"> <li>Notice that animals, including humans, have offspring which grow into adults (PSHE link)</li> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (PSHE and PE link)</li> </ul> <p><u>Materials and their properties</u></p> <ul style="list-style-type: none"> <li>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses (Link to DT) (Y1 previous learning)</li> <li>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Link to Art and clay)</li> <li>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock (recap)</li> </ul>
Year 3	<ul style="list-style-type: none"> <li><u>Working scientifically - Scientific write-ups to focus on key questions, prediction and method</u></li> <li>Ask relevant questions and use some scientific knowledge to answer them</li> <li>Set up simple comparative fair tests designed as a class</li> <li>Set up observational activities and record findings - identify similarities and differences</li> <li>Make careful observations and take measurements using standard units</li> </ul>	<p><u>Plants</u></p> <ul style="list-style-type: none"> <li>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flower and how these relate to the way in which water is transported within plants</li> <li>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 (Y2 previous learning - nutrients from soil and room not mentioned in Year 2 )</li> <li>Investigate the way in which water is transported within plants</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul> <p><u>Animals, including humans</u></p> <ul style="list-style-type: none"> <li>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 - (link to DT and healthy diet) (Y2 previous learning)</li> </ul>



	<ul style="list-style-type: none"> <li>Record and report on findings using given scientific language. This could be orally or through drawings and diagrams</li> <li>Use results to discuss conclusions, answer questions posed and use scientific evidence</li> </ul> <p><u>Types of enquiry</u></p> <ul style="list-style-type: none"> <li>Observing over time</li> <li>Comparative fair testing</li> <li>Pattern seeking</li> </ul>	<ul style="list-style-type: none"> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> <li>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene (this could be covered in PSHE)</li> </ul> <p><u>Rocks</u></p> <ul style="list-style-type: none"> <li>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>Recognise that soils are made from rocks and organic matter.</li> </ul> <p><u>Light</u></p> <ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light (Y6 previous learning - light travels to the eyes)</li> <li>Notice that light is reflected from surfaces</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>Recognise that shadows are formed when the light from a light source is blocked by an opaque object (See Y6 learning - linked to light travelling in straight lines)</li> <li>Find patterns in the way that the size of shadows change</li> </ul> <p><u>Forces and magnets</u></p> <ul style="list-style-type: none"> <li>Compare how things move on different surfaces (Y5 learning - friction and air resistance)</li> <li>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>Observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>Describe magnets as having two poles</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>
Year 4	<p><u>Working scientifically - Scientific write ups to focus on - key question, prediction, method (including fair testing) and results</u></p> <ul style="list-style-type: none"> <li>Ask relevant questions and use some scientific knowledge to answer them</li> <li>Set up scientific enquiries as a class and fair tests - identify variables and measures</li> </ul>	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways</li> <li>Explore and use <u>classification keys</u> to help group, identify, and name a variety of living things in their local and wider environment</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things relate this to environmental issues (link to rivers in geography)</li> </ul>



- Make careful observations, take accurate measurements and, where appropriate, use equipment including data loggers
- Gather, record and present data to help answer a question
- Record findings using given scientific language - this could be orally, written, through drawings, diagrams, charts and graphs
- Report on findings, including oral presentations and written explanations - use straightforward scientific language to support their findings
- Use results to suggest further ideas for investigation, raise questions and predict what might happen
- Identify changes that are occurring using scientific ideas

### Types of enquiry

- Comparative fair testing
- Research using secondary sources (teeth)
- Grouping and classifying

- 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
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain (this is from year 2 to be taught 2021/2022)

### Animals, Including humans

- Describe the simple functions of the basic parts of the digestive system in humans
- Identify the different types of teeth in humans and their simple functions
- Construct and interpret a variety of food chains, identifying producers, predators and prey.
- identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- identify that humans and some other animals have skeletons and muscles for support, protection and movement

### States of matter

- Compare and group materials together, according to whether they are solids, liquids or gases
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature (link to Geography)

### Sound

- Identify how sounds are made, associating some of them with something vibrating
- Recognise that vibrations from sounds travel through a medium to the ear
- Find patterns between the pitch of a sound and features of the object that produced it
- Find patterns between the volume of a sound and the strength of the vibrations that produced it
- Recognise that sounds get fainter as the distance from the sound source increases.

### Electricity

- Identify common appliances that run on electricity.
- Construct a simple series electrical circuit, identifying and naming its basic parts (Link to DT and computing)



		<ul style="list-style-type: none"> <li>• Draw simple circuits as the physical objects rather than a circuit diagram.</li> <li>• Recognise that a switch opens and closes a circuit.</li> <li>• Recognise some common conductors and insulators &amp; associate metals with being good conductors.</li> <li>• Use learning to identify whether or not a lamp will light in a simple series circuit and explain why.</li> </ul> <p><i>Y6 learning includes circuit diagrams and investigations into the amount of components within a circuit</i></p>
<p>Year 5</p>	<p><u>Working scientifically - Scientific write-ups focus on key question, fair test statement (where appropriate), results and conclusion</u></p> <ul style="list-style-type: none"> <li>• With support and prompts, plan an experiment or enquiry to help answer a question, including the control of variables to ensure a fair test</li> <li>• Take measurements with increasing accuracy and repeat when necessary</li> <li>• Record data and results using scientific diagrams, tables, bar and line graphs</li> <li>• Use test results to make predictions and <b>design</b> a further test (<i>This will draw on skills from previous years</i>)</li> <li>• Report and present findings from enquiries in oral and written form - use appropriate key scientific vocabulary from the topic studied.</li> <li>• Identify causal relationships</li> <li>• Identify evidence used to support or refute ideas or arguments for the topic studied</li> </ul> <p><u>Types of enquiry</u></p> <ul style="list-style-type: none"> <li>• Comparative fair testing</li> <li>• Observing over time (changes in humans)</li> <li>• Research using secondary sources (Earth and Space)</li> <li>• Grouping and classifying</li> </ul>	<p><u>Living Things and their Habitats</u> <a href="#">(link to PSHE)</a></p> <ul style="list-style-type: none"> <li>• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>• Describe the life process of reproduction in some plants and animals</li> <li>• <i>construct and interpret a variety of food chains, identifying producers, predators and prey</i></li> <li>• <i>recognise that living things can be grouped in a variety of ways</i></li> <li>• <i>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</i></li> <li>• <i>recognise that environments can change and that this can sometimes pose dangers to living things (from year 4 so should be taught in 2020/2021)</i></li> </ul> <p><u>Animals including humans</u></p> <ul style="list-style-type: none"> <li>• Describe the changes as humans develop to old age <a href="#">(link to PSHE)</a></li> </ul> <p><u>Properties and changes of materials</u></p> <ul style="list-style-type: none"> <li>• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, <i>conductivity (electrical and thermal), and response to magnets (Y1, Y2, Y3 (magnets), Y4 (conductors) previous learning)</i></li> <li>• Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating (<i>Y4 previous learning - evaporation</i>)</li> <li>• Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>• Demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>• Give reasons for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• 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.</li> </ul> <p><u>Earth and Space</u></p> <ul style="list-style-type: none"> <li>• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>• Describe the movement of the Moon relative to the Earth</li> </ul>



		<ul style="list-style-type: none"> <li>Describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky. (Y3 previous learning - shadows investigation)</li> </ul> <p><u>Forces</u></p> <ul style="list-style-type: none"> <li>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. (link to DT)</li> </ul>
Year 6	<p><u>Working scientifically - Scientific write-ups focus on key question, fair test statement (where appropriate), results, conclusion and evaluation</u></p> <ul style="list-style-type: none"> <li>Plan an experiment or enquiry to help answer a question, including the control of variables</li> <li>Take measurements with a range of equipment with increasing accuracy and repeat readings when necessary</li> <li>Record data and results using scientific diagrams, tables, line graphs, scatter graphs and classification keys</li> <li>Use test results to make predictions and design a further test - when appropriate, conduct these tests and compare results orally</li> <li>Report and present findings from enquiries in oral and written form - use appropriate key scientific vocabulary from the topic studied. Report on causal relationships</li> <li>Evaluate a designed test, including a statement of trust in the results and how valid they are</li> <li>Identify evidence used to support or refute ideas or arguments for the topic studied</li> </ul> <p><u>Types of enquiry</u></p>	<p><u>Living Things and their Habitats</u></p> <ul style="list-style-type: none"> <li>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 (Y2 and Y4 previous learning)</li> <li>Give reasons for classifying plants and animals based on specific characteristics.</li> <li>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>describe the life process of reproduction in some plants and animal (from year 5 so to be taught in 2020/2021)</li> </ul> <p><u>Animals including humans</u></p> <ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans.</li> <li>describe the simple functions of the basic parts of the digestive system in humans</li> <li>identify the different types of teeth in humans and their simple functions (from year 4, so should be taught in 2021/2022)</li> </ul> <p><u>Evolution and inheritance</u> (Link to PSHE)</p> <ul style="list-style-type: none"> <li>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul> <p><u>Light</u></p>



- Research using secondary sources (Evolution)
- Grouping and classifying
- Pattern spotting
- Comparative, fair testing

- Recognise that light appears to travel in straight lines
- Use the idea that light travels in straight lines to create diagrams to explain that objects are seen because they give out or reflect light into the eye (Y3 previous learning)
- 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 (Y3 previous learning)
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. (Y3 and Y5 previous learning - shadow size investigation completed in Y3)
- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that the size of shadows change (from year 3 so should be taught in 2022/2023)

### Electricity

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches (Y4 previous learning on circuits)
- Use recognised symbols when representing a simple circuit in a diagram. (Y4 previous learning on circuits)