



**Shelton Junior School**  
**LKS2 Science Long-Term Progression of Knowledge and Skills**



**DISCOVER – resilience and collaboration**

**INVESTIGATE – reflection and concentration**

**EXPLORE - curiosity**

**Heroic Heritage – Why are beliefs important?**

**Nurturing Nature – How do plants and living things flourish?**

**Go With The Flow – How do people choose where to settle?**

**Year A**

- Rocks & fossils (Y3) Chemistry**
- ✓ I can compare and group rocks based on their appearance and physical properties, giving reasons
  - ✓ I can recognise how soil is made and describe how fossils are formed
  - ✓ I can recognise the difference between sedimentary, metamorphic and igneous rock

**Animals, including humans (Y3) Biology**

- ✓ I can explain the importance of a nutritious, balanced diet
- ✓ I can understand how nutrients, water and oxygen are transported within animals and humans
- ✓ I can identify the skeletal and muscular system of a human

**Plants (Y3) Biology**

- ✓ I can explain the function of different parts of flowering plants and trees
- ✓ I can explain how water is transported within plants
- ✓ I can explain the plant life cycle, especially the importance of flowers

**Light (Y3) Physics**

- ✓ I can recognise that dark is the absence of light
- ✓ I can notice that light is needed in order to see and is reflected from a surface
- ✓ I can recognise and can demonstrate how a shadow is formed and find patterns in the way a shadow changes shape
- ✓ I can recognise the dangers of direct sunlight and can explain how to keep protected

**Scientific enquiry**

**Rocks and fossils**  
 Observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time

**Animals including humans**  
 Identifying and grouping animals with and without skeletons and observing and comparing their movement

**Plants**  
 Discovering how seeds are formed by observing the different stages of plant life cycles over a period of time;

**Light**  
 Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.

	<b>Incredible Invaders – Why do people always want more?</b>	<b>Magnets and Matter – Are all changes irreversible?</b>	<b>Active Planet – How do we control our emotions?</b>
<b>Year B</b>	<p><b>Sound (Y4) Physics</b></p> <ul style="list-style-type: none"> <li>✓ I can identify how sound is made, associating some of them with vibrating</li> <li>✓ I can recognise how sound travels from a source to our ears</li> <li>✓ I can find patterns between pitch and the object producing a sound</li> <li>✓ I can find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>✓ I can recognise what happens to a sound as it travels away from its source</li> </ul>	<p><b>States of matter (Y4) Chemistry</b></p> <ul style="list-style-type: none"> <li>✓ I can observe and explore the temperature at which materials change state</li> <li>✓ I can observe and explore how some materials can change state</li> <li>✓ I can compare and group materials together based on their state of matter (solid, liquid, gas)</li> <li>✓ I can identify the part played by evaporation and condensation in the water cycle</li> </ul> <p><b>Forces &amp; magnets (Y3) Physics</b></p> <ul style="list-style-type: none"> <li>✓ I can compare how things move on different surfaces</li> <li>✓ I can notice how some forces require contact and some do not, giving examples</li> <li>✓ I can describe magnets having two poles</li> <li>✓ I can observe how magnets attract and repel each other, depending on which way the poles are facing</li> <li>✓ I can compare and group together a variety of everyday materials on the basis of whether they are magnetic and identify some magnetic materials</li> <li>✓ I can predict whether two magnets will attract or repel each other</li> </ul>	<p><b>Electricity (Y4) Physics</b></p> <ul style="list-style-type: none"> <li>✓ I can identify and name appliances that require electricity to function</li> <li>✓ I can construct a series circuit</li> <li>✓ I can identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers)</li> <li>✓ I can predict and test whether a lamp will light within a circuit</li> <li>✓ I can recognise the function of a switch</li> <li>✓ I can recognise the difference between a conductor and an insulator; giving examples of each</li> </ul> <p><b>Animals, including humans (Y4) Physics</b></p> <ul style="list-style-type: none"> <li>✓ I can identify and name the parts of the human digestive system</li> <li>✓ I can describe the functions of the organs in the human digestive system</li> <li>✓ I can identify and know the different types of human teeth and their functions</li> <li>✓ I can construct food chains to identify producers, predators and prey</li> </ul> <p><b>Living things and their habitats (Y4) Biology</b></p> <ul style="list-style-type: none"> <li>✓ I can recognise that living things can be grouped in a variety of ways</li> <li>✓ I can use classification keys to group, identify and name living things</li> <li>✓ I can recognise how changes to an environment could endanger living things</li> </ul>
<b>Scientific enquiry</b>	<p><b>Sound</b></p> <p>Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses</p>	<p><b>States of Matter</b></p> <p>Observe and record evaporation over a period of time</p>	<p><b>Electricity</b></p> <p>Observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to</p>

	<p>Make earmuffs from a variety of different materials to investigate which provides the best insulation against sound</p>	<p><b>Forces and Magnets</b> Carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions.</p>	<p>connect across a gap in a circuit</p> <p><b>Animals including humans</b> Present to the class their ideas about the digestive system and compare them with models or images</p> <p><b>Living things and their habitats</b> Making a guide to local living things in Derby</p>
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	Year 3 Skills	Year 4 Skills
Asking questions	<p>Ask questions such as:</p> <ul style="list-style-type: none"> <li>• Why does the moon appear as different shapes in the night sky?</li> <li>• Why do shadows change during the day?</li> <li>• Where does a fossil come from?</li> </ul>	<p>Ask questions such as:</p> <ul style="list-style-type: none"> <li>• Why are steam and ice the same thing?</li> <li>• Why is the liver important in the digestive systems?</li> <li>• What do we mean by 'pitch' when it comes to sound?</li> </ul> <p>• Ask questions about new vocabulary they haven't seen before</p>
Making predictions	<p>Make predictions such as:</p> <ul style="list-style-type: none"> <li>• The time of day a shadow is likely to be at its longest or shortest</li> <li>• Which types of plants grow in different places e.g. bluebells in woodlands, roses in a domestic garden, etc.</li> <li>• Can you use a reflection to see around a corner?</li> </ul>	<ul style="list-style-type: none"> <li>• When making predictions there are plausible reasons as to why they have done so</li> <li>• Make predictions such as: <ul style="list-style-type: none"> <li>- How much time does it take to digest our food?</li> <li>- Which materials will make good conductors and insulators of electricity?</li> </ul> </li> </ul>
Setting up tests	<ul style="list-style-type: none"> <li>• Set up a fair test with different variables e.g. what are the best conditions for a plant to grow? Which type of soil is most suitable when growing two similar plants? etc.</li> <li>• Explain to a partner why a test is a fair one</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out tests to see, for example, which of two instruments make the highest or lowest sounds and to see if a glass of ice weighs the same as a glass of water</li> <li>• Set up a fair test with more than one variable e.g. using different materials to cut out sound</li> <li>• Explain to others why a test that has been set up is a fair one e.g. discover how fast ice melts in different temperatures</li> </ul>
Observing and measuring	<ul style="list-style-type: none"> <li>• Observe at what time of day a shadow is likely to be at its longest and shortest</li> <li>• Observe which type of plants grow in different places e.g. bluebells in woodland, roses in domestic gardens, etc.</li> <li>• Measure carefully (taking account of mathematical knowledge up to Year 3) and add to scientific learning</li> </ul>	<ul style="list-style-type: none"> <li>• Measure carefully (taking account of mathematical knowledge up to Year 4) and add to scientific learning</li> <li>• Use a data logger to check on the time it takes ice to melt to water in different temperatures</li> <li>• Use a thermometer to measure temperature and know there are two main scales used to measure temperature</li> </ul>

	<ul style="list-style-type: none"> <li>• Use a thermometer to measure temperature and know there are two main scales used to measure temperature</li> </ul>	
Recording data	<ul style="list-style-type: none"> <li>• Gather and record information using a chart, matrix or tally chart, depending on what is most sensible</li> <li>• Use bar charts and other statistical tables (in line with Year 3 mathematics statistics) to record findings</li> </ul>	<ul style="list-style-type: none"> <li>• Gather and record information using a chart, matrix or tally chart, depending on what is most sensible</li> <li>• Use bar charts and other statistical tables (in line with Year 4 mathematics statistics) to record findings</li> </ul>
Interpreting and communicating results	<ul style="list-style-type: none"> <li>• Group information according to common factors e.g. plants that grow in woodlands or plants that grow in gardens</li> <li>• Know how to use a key to help understand information presented on a chart</li> <li>• Present findings using written explanations and include diagrams when needed</li> <li>• Be confident to stand in front of others and explain what has been found out, for example about the life cycle of a plant</li> </ul>	<ul style="list-style-type: none"> <li>• Present findings using written explanations and include diagrams, when needed</li> <li>• Write up findings using a planning, doing and evaluating process</li> </ul>
Evaluating	<ul style="list-style-type: none"> <li>• Make sense of findings and draw conclusions which help them to understand more about scientific information</li> <li>• Amend predictions according to findings</li> <li>• Be prepared to change ideas as a result of what has been found out during a scientific enquiry</li> </ul>	<ul style="list-style-type: none"> <li>• Make sense of findings and draw conclusions which helps them understand more about the scientific information that has been learned</li> <li>• Able to amend predictions according to findings</li> <li>• Be prepared to change ideas as a result of what has been found out during a scientific enquiry</li> </ul>



# Shelton Junior School



## UKS2 Science Long-Term Progression of Knowledge and Skills

	DISCOVER – resilience and collaboration	INVESTIGATE – reflection and concentration	EXPLORE - curiosity
<b>Year A</b>	<b>Seeking Safety – Does adversity always make you stronger?</b>	<b>Stayin’ Alive – Are all living things equal?</b>	<b>The Amazing Americas – Do we always appreciate what we’ve got?</b>
	<p><b>Light (Y6) Physics</b></p> <ul style="list-style-type: none"> <li>✓ I can recognise how light travels</li> <li>✓ I can 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</li> <li>✓ I can explain that we see things because light travels from light sources to objects and then to the eyes</li> <li>✓ I can use the idea that light travels in straight lines to explain why shadows have the same shape as the object that casts them</li> <li>✓ I can recognise how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</li> </ul>	<p><b>Living things and their habitats (Y5) Biology</b></p> <ul style="list-style-type: none"> <li>✓ I can describe the life cycle of different living things e.g. mammal, amphibian, insect and bird</li> <li>✓ I can describe the differences between different life cycles</li> <li>✓ I can describe the process of reproduction in plants</li> </ul> <p><b>Animals, including humans (Y5) Biology</b></p> <ul style="list-style-type: none"> <li>✓ I can describe the changes as humans develop to old age</li> </ul> <p><b>Animals, including humans (Y6) B</b></p> <ul style="list-style-type: none"> <li>✓ I can identify and name the main parts of the human circulatory system</li> <li>✓ I can describe the function of the heart, blood vessels and blood</li> <li>✓ I recognise the impact of diet, exercise, drugs and lifestyle on health</li> <li>✓ I can describe the ways in which nutrients and water are transported in animals, including humans</li> </ul> <p><b>Properties and changes of materials (Y5) Chemistry</b></p> <ul style="list-style-type: none"> <li>✓ I use my knowledge of solids, liquids and gases to decide how mixtures might be separated</li> <li>✓ I can explain how some materials can be separated (e.g. through filtering, sieving and evaporating)</li> </ul>	<p><b>Electricity (Y6) Physics</b></p> <ul style="list-style-type: none"> <li>✓ I can compare and give reasons for why components work and do not work in a circuit</li> <li>✓ I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>✓ I can 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</li> <li>✓ I can use recognised symbols when representing a simple circuit in a diagram.</li> </ul>

		<ul style="list-style-type: none"> <li>✓ I know and can demonstrate that some changes are reversible and some are not</li> <li>✓ I can explain how some changes result in the formation of a new material and that this is usually irreversible</li> <li>✓ I understand and can explain how a material dissolves to form a solution and how to recover a substance from a solution</li> </ul>	
<b>Scientific enquiry</b>	<p><b>Light</b> Design and make a periscope using the idea that light appears to travel in straight lines to explain how it works</p>	<p><b>Living things and their habitats</b> Try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs</p> <p><b>Animals, including humans</b> Research the gestation periods of other animals, comparing them with humans Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health</p> <p><b>Properties and changes of materials</b> Explore separating mixtures using various methods: sieving, evaporation, magnetism and decanting.</p>	<p><b>Electricity</b> Identify the effect of changing one component at a time in a circuit</p>
<b>Year B</b>	<b>Ancient Civilisations – Why do people have different beliefs?</b>	<b>Survival of the Fittest – What’s the difference between surviving and living?</b>	<b>Amazon Adventures – Why do people explore?</b>
	<p><b>Properties and changes of materials (Y5) C</b></p> <ul style="list-style-type: none"> <li>✓ I can compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical &amp; thermal], and response to magnets</li> <li>✓ I know and can demonstrate that some changes are reversible and some are not</li> </ul>	<p><b>Living things and their habitats (Y6) B</b></p> <ul style="list-style-type: none"> <li>✓ I can describe how living things are classified into broad groups based on observable characteristics, including micro-organisms, plants and animals</li> <li>✓ I can describe similarities and differences</li> <li>✓ I can give reasons for classifying plants and animals based on specific characteristics</li> </ul>	<p><b>Forces (Y5) P</b></p> <ul style="list-style-type: none"> <li>✓ I can explain what gravity is and its impact on our lives</li> <li>✓ I can identify and know the effect of air and water resistance</li> <li>✓ I can identify and know the effect of friction</li> <li>✓ I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</li> </ul>

		<p><b>Evolution and adaptation/inheritance (Y6) B</b></p> <ul style="list-style-type: none"> <li>✓ I can recognise that the Earth and living things have changed over time</li> <li>✓ I can recognise that fossils can be used to find out about the past</li> <li>✓ I can recognise that living things produce offspring of the same kind, but offspring normally vary and are not identical to their parents</li> <li>✓ I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul>	<p><b>Earth and space (Y5) P</b></p> <ul style="list-style-type: none"> <li>✓ I can describe the movement of the Earth and other planets relative to the Sun</li> <li>✓ I can describe the movement of the Moon relative to the Earth</li> <li>✓ I can describe the Sun, Earth and Moon (using the term spherical)</li> <li>✓ I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul>
<p><b>Scientific enquiry</b></p>	<p><b>Properties and changes of materials</b> Carry out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'</p>	<p><b>Living things and their habitats</b> Use classification systems and keys to identify some animals and plants in the immediate environment.</p> <p><b>Evolution and adaptation/inheritance</b> Comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels</p>	<p><b>Forces</b> Explore falling paper cones or cup-cake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective.</p> <p><b>Earth and Space</b> Creating simple models of the solar system Construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day</p>

	<b>Year 5 Skills</b>	<b>Year 6 Skills</b>
Asking questions	Ask questions about: <ul style="list-style-type: none"> <li>• New scientific words that they have come across for the first time</li> </ul>	Ask questions about: <ul style="list-style-type: none"> <li>• New scientific words that they have come across for the first time</li> </ul>
Making predictions	<ul style="list-style-type: none"> <li>• Make predictions based on information gleaned from investigations</li> </ul>	<ul style="list-style-type: none"> <li>• Make accurate predictions based on information gleaned from their investigations and create new investigations as a result</li> </ul>
Setting up tests	<ul style="list-style-type: none"> <li>• Create new investigations which take account of what has been learned previously</li> <li>• Set up an investigation when it is appropriate e.g. finding out which materials dissolve or not</li> <li>• Set up a fair test when needed e.g. which surfaces create most friction?</li> <li>• Set up an enquiry based investigation e.g. find out what adults / children can do now that they couldn't when a baby</li> <li>• Set up an enquiry based investigation e.g. find out what adults / children can do now that they couldn't when a baby</li> <li>• Know what the variables are in a given enquiry and can isolate each one when investigating e.g. finding out how effective parachutes are when made with different materials</li> </ul>	<ul style="list-style-type: none"> <li>• Know which type of investigation is needed to suit particular scientific enquiry e.g. looking at the relationship between pulse and exercise</li> <li>• Set up a fair test when needed e.g. does light travel in straight lines?</li> <li>• Know how to set up an enquiry based investigation e.g. what is the relationship between oxygen and blood?</li> <li>• Know what the variables are in a given enquiry and can isolate each one when investigating</li> <li>• Justify which variable has been isolated in scientific investigation</li> </ul>
Observing and measuring	<ul style="list-style-type: none"> <li>• Frequently carry out research when investigating a scientific principle or theory</li> <li>• Use all measurements as set out in Year 5 mathematics (measurement), including capacity and mass</li> <li>• Use other scientific instruments as needed e.g. thermometer, rain gauge, spring scales (for measuring Newtons)</li> </ul>	<ul style="list-style-type: none"> <li>• Use all measurements as set out in Year 6 mathematics (measurement), including capacity, mass, ratio and proportion</li> </ul>
Recording data	<ul style="list-style-type: none"> <li>• Able to record data and present them in a range of ways including diagrams, labels, classification keys, tables, scatter graphs and bar and line graphs</li> </ul>	<ul style="list-style-type: none"> <li>• Able to record data and present them in a range of ways including diagrams, labels, classification keys, tables, scatter graphs and bar and line graphs</li> </ul>
Interpreting and communicating results	<ul style="list-style-type: none"> <li>• Able to present information related to scientific enquiries in a range of ways including using IT such as power-point and video presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Able to present information related to scientific enquiries in a range of ways including using IT such as power-point, animoto and Windows Movie Maker</li> </ul>

	<p>Use diagrams, as and when necessary, to support writing</p>	<ul style="list-style-type: none"> <li>• Use a range of written methods to report findings, including focusing on the planning, doing and evaluating phases</li> <li>• Keep an on-going record of new scientific words that they have come across for the first time and use these regularly in future scientific write ups</li> <li>• Use diagrams, as and when necessary, to support writing and be confident enough to present findings orally in front of the class</li> </ul>
<p>Evaluating</p>	<ul style="list-style-type: none"> <li>• Is evaluative when explaining findings from scientific enquiry</li> <li>• Clear about what has been found out from recent enquiry and can relate this to other enquiries, where appropriate</li> <li>• Their explanations set out clearly why something has happened and its possible impact on other things</li> <li>• Able to give an example of something focused on when supporting a scientific theory e.g. how much easier it is to lift a heavy object using pulleys</li> <li>• Able to relate causal relationships when, for example, studying life cycles</li> </ul>	<ul style="list-style-type: none"> <li>• Clear about what has been found out from their enquiry and can relate this to others in class</li> <li>• Explanations set out clearly why something has happened and its possible impact on other things</li> <li>• Aware of the need to support conclusions with evidence</li> <li>• Able to give an example of something they have focused on when supporting a scientific theory e.g. classifying vertebrate and invertebrate creatures or why certain creatures choose their unique habitats</li> </ul>