



# Progression Documents

## Science

Intent	Implementation	Impact
<p>The 2014 National Curriculum for Science aims to ensure that all children:</p> <ul style="list-style-type: none"> <li>• Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics</li> <li>• Develop understanding of the nature, processes and methods of Science through different types of Science enquiries that help them to answer scientific questions about the world around them</li> <li>• Are equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future</li> </ul> <p>At Spalding St Paul's Primary School, we ensure that children have a varied, progressive and well-mapped-out science curriculum that provides the opportunity for progression across the full breadth of the science national curriculum for KS1 and KS2.</p> <p>It is our intention to develop in all young people a lifelong curiosity and interest in the sciences. When planning for the science curriculum, we intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions.</p>	<p>The acquisition of key scientific knowledge is an integral part of our science lessons. Linked knowledge enable children to learn and retain the important, useful and powerful vocabulary and knowledge contained within each unit. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons. Each lesson has a clear focus. Scientific knowledge and enquiry skills are developed with increasing depth and challenge as children move through the year groups. They complete investigations and hands-on activities while gaining the scientific knowledge for each unit. Interwoven into the teaching sequence are key assessment questions. These allow teachers to assess children's levels of understanding at various points in the lesson. They also enable opportunities to recap concepts where necessary. The sequence of lessons helps to embed scientific knowledge and skills, with each lesson building on previous learning. There is also the opportunity to regularly review and evaluate children's understanding. Activities are effectively differentiated so that all children have an appropriate level of support and challenge.</p>	<p>Progress is measured through a child's ability to know more, remember more and explain more. This can be measured in different ways in school. The learning environment across the school will be more consistent with science technical vocabulary displayed, spoken and used by all learners. Whole-school and parental engagement will be improved through the use of science-specific home learning tasks and shared use of knowledge and skills. Children who feel confident in their science knowledge and enquiry skills will be excited about science, show that they are actively curious to learn more and will see the relevance of what they learn in science lessons to real-life situations and also the importance of science in the real world.</p>

Breadth of study:			
Breadth of study Key Stage 1:			
Pupils should be taught about:			
BOIOLOGY		CHEMISTRY	PHYSICS
<b>Plants</b> <ul style="list-style-type: none"> <li>Look at the function of parts of flowering plants, requirements of growth, water transportation in plants, life cycles and seed dispersal.</li> </ul> <b>Evolution and inheritance</b> <ul style="list-style-type: none"> <li>Look at resemblance in offspring.</li> <li>Look at changes in animals over time.</li> <li>Look at adaptation to environments.</li> <li>Look at difference in offspring.</li> <li>Look at adaptations and evolution.</li> <li>Look at changes to the human skeleton over time.</li> </ul>	<b>Animals and humans</b> <ul style="list-style-type: none"> <li>Look at nutrition, transportation of water and nutrients in the body and the muscle skeleton system of humans and animals.</li> <li>Look at the digestive system in humans.</li> <li>Look at teeth.</li> <li>Look at the human circulatory system.</li> </ul> <b>All living things</b> <ul style="list-style-type: none"> <li>Identify and name plants and animals.</li> <li>Look at classification keys.</li> <li>Look at the life cycle of animals and plants.</li> <li>Look at the classification of plants, animals and micro-organisms.</li> <li>Look at reproduction in plants and animals and human growth and changes.</li> <li>Look at the effect if diet, exercise and drugs</li> </ul>	<b>Materials</b> <ul style="list-style-type: none"> <li>Identify, name, describe, classify and compare properties and changes.</li> <li>Look at the practical uses of everyday materials.</li> </ul>	<b>Forces</b> <ul style="list-style-type: none"> <li>Describe basic movements.</li> </ul> <b>Earth and Space</b> <ul style="list-style-type: none"> <li>Observe seasonal changes.</li> </ul>
Breadth of study Key Stage 2:			
Pupils should be taught about:			
BIOLOGY	CHEMISTRY	PHYSICS	
<b>Plants</b> <ul style="list-style-type: none"> <li>Look at the function of parts of flowering plants, requirements of growth, water transportation in plants, life cycles and seed dispersal.</li> </ul> <b>Evolution and inheritance</b> <ul style="list-style-type: none"> <li>Look at resemblance in offspring.</li> <li>Look at changes in animals over time.</li> <li>Look at adaptation to environments.</li> <li>Look at difference in offspring.</li> <li>Look at adaptations and evolution.</li> <li>Look at changes to the human skeleton over time.</li> <li>Look at the life cycle of animals and plants.</li> <li>Look at the classification of plants, animals and micro-organisms.</li> <li>Look at reproduction in plants and animals and human growth and changes.</li> <li>Look at the effect if diet, exercise and drugs.</li> </ul> <b>Animals and humans</b> <ul style="list-style-type: none"> <li>Look at nutrition, transportation of water and nutrients in the body and the muscle skeleton system of humans and animals.</li> <li>Look at the digestive system in humans.</li> <li>Look at teeth.</li> <li>Look at the human circulatory system.</li> </ul> <b>All living things</b> <ul style="list-style-type: none"> <li>Identify and name plants and animals.</li> <li>Look at classification keys.</li> </ul>	<b>Rocks and Fossils</b> <ul style="list-style-type: none"> <li>Compare and group rocks and describe the formation of fossils.</li> </ul> <b>States of matter</b> <ul style="list-style-type: none"> <li>Look at solids, liquids and gases, change of state, evaporation, condensation and the water cycle.</li> </ul> <b>Materials</b> <ul style="list-style-type: none"> <li>Examine the properties of materials using various tests</li> <li>Look at solubility and recovering dissolved substances</li> <li>Separate mixtures.</li> </ul> Examine changes to materials that create new materials that are usually not reversible.	<b>Light</b> <ul style="list-style-type: none"> <li>Look at sources, seeing, reflections and shadows.</li> <li>Explain how light appears to travel in straight lines and how this affects seeing and shadows.</li> </ul> <b>Sound</b> <ul style="list-style-type: none"> <li>Look at sources, vibration, volume and pitch.</li> </ul> <b>Electricity</b> <ul style="list-style-type: none"> <li>Look at appliances, circuits, lamps, switches, insulators and conductors.</li> </ul> <b>Forces and Magnets</b> <ul style="list-style-type: none"> <li>Look at contact and distant forces, attraction and repulsion, comparing and grouping materials.</li> <li>Look at poles, attraction and repulsion.</li> <li>Look at the effect of gravity and drag forces.</li> <li>Look at transference of forces in gears pulleys, levers and springs.</li> </ul> <b>Earth and Space</b> <ul style="list-style-type: none"> <li>Look at movement of the Earth and the Moon.</li> <li>Explain day and night</li> </ul>	

Threshold Concepts			
Working Scientifically	Biology	Physics	Chemistry
<p>This concept involves learning the methodologies of the discipline of Science.</p>	<p><b>Understand plants-</b> This concept involves becoming familiar with different types of plants, their structure and reproduction.</p> <p><b>Understand animals and humans-</b> This concept involves becoming familiar with different types of animals, humans and the life processes they share.</p> <p><b>Investigate living things-</b> This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.</p> <p><b>Understand evolution and inheritance-</b> This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.</p>	<p><b>Understand movement, forces and magnets-</b> This concept involves understanding what causes motion. Understand the Earth's movement in space- This concept involves understanding what causes seasonal changes, day and night.</p> <p><b>Investigate light and seeing-</b> This concept involves understanding how light and reflection affect sight. Investigate sound and hearing- This concept involves understanding how sound is produced, how it travels and how they are heard.</p> <p><b>Understand electrical circuits-</b> This concept involves understanding circuits and their role in electrical applications.</p>	<p><b>Investigate materials-</b> This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.</p>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Working Scientifically</b> (to be delivered through teaching of subject content and not to be taught separately)</p>	<p>Ask simple questions and recognising that they can be answered in different ways.</p> <p>Observe closely using simple equipment.</p> <p>Perform simple tests and evaluate the findings.</p> <p>Identify and classify.</p> <p>Record findings: drawings, diagrams, photographs, simple prepared formats, such as tables and charts, tally charts and displays</p>	<p>Observe closely using simple equipment.</p> <p>Perform simple tests, make predictions, measure and evaluate findings.</p> <p>Identify and classify.</p> <p>Record findings: drawings, diagrams, photographs, simple prepared formats, such as tables and charts, tally charts and displays.</p>	<p>Ask relevant questions using different types of scientific enquiries to answer.</p> <p>Set up simple practical enquiries, comparative and fair tests.</p> <p>Begin to make accurate measurements using standard units (inc. data loggers).</p> <p>Record findings using simple scientific language, drawings, labeled diagrams, bar charts and tables.</p> <p>Report findings from investigations including written explanations of results and conclusions, displays or presentations.</p> <p>Use results to draw simple conclusions and suggest improvements and predictions for setting up further tests.</p> <p>Look for similarities and differences or changes in data in order to draw conclusions.</p> <p>Use straightforward scientific language to answer questions or to support findings.</p>	<p>Ask relevant questions using different types of scientific enquiries to answer.</p> <p>Set up simple practical enquiries, comparative and fair tests using a range of equipment.</p> <p>Make systematic and careful observations. Make accurate measurements using standard units (inc. data loggers and thermometers).</p> <p>Record findings using simple scientific language, drawings, labeled diagrams, keys, bar charts and tables.</p> <p>Report findings from investigations including oral and written explanations of results and conclusions, displays or presentations.</p> <p>Use results to draw simple conclusions, make predictions for new values and suggest improvements.</p> <p>Use straightforward scientific evidence to answer questions or to support findings (using secondary sources).</p>	<p>Plan different types of scientific enquiries to answer questions, including recognizing and controlling variables where necessary.</p> <p>Take measurements, using a range of equipment, with increasing accuracy, taking repeat readings when appropriate.</p> <p>Record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Use test results to make predictions to set up further comparative tests.</p> <p>Report and present findings from enquiries, including conclusions, causal relationships and explanations of degrees of trust in tests, in oral and written forms.</p>	<p>Plan different types of scientific enquiries to answer questions, including recognizing and controlling variables where necessary.</p> <p>Take measurements, using a range of equipment, with complete accuracy, taking repeat readings when appropriate.</p> <p>Record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Continue to use test results to make predictions to set up further comparative tests.</p> <p>Report and present findings from enquiries, including conclusions, causal relationships and explanations of degrees of trust in tests, in oral and written forms.</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology: Plants	<p>Identify and name a variety of common plants (including garden plants, wild plants and trees and those that are classified as deciduous and evergreen).</p> <p>Describe basic structure of common plants (including root, stem, leaves and flowers).</p>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Describe how plants need water, light, and suitable temp to grow and stay healthy.</p>	<p>Identify/describe the functions of different parts of flowering plants (inc. roots, stem/trunk, leaves and flower).</p> <p>Identify requirements of plants for life and growth and how they vary from plant to plant (air, light, water, nutrients from soil and room to grow).</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 (inc. pollination, seed formation and seed dispersal)</p>	N/A	N/A	N/A
Biology: Animals Including Humans	<p>Identify/name a variety of animals that are birds, fish, amphibians, reptiles, mammals and invertebrates.</p> <p>Identify and name a variety of carnivores, herbivores &amp; omnivores.</p> <p>Describe/compare the body parts of common animals (inc. fish, reptiles, amphibians, birds, mammals and pets).</p> <p>Identify, name and draw basic parts of human body and relate to senses.</p>	<p>Understand that animals, including humans, have offspring that grow into adults.</p> <p>Find out and describe the basic needs of animals for survival (water, food, air).</p> <p>Describe the importance of exercise, eating the right amounts of food and hygiene for humans.</p>	<p>Identify and describe how animals, including humans, need the right types and amounts of nutrients, that they cannot make their own food but that they get nutrients from what they eat.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators, prey, herbivores, carnivores and omnivores.</p> <p>Explain how a feeding relationship occurs in a variety of habitats.</p>	<p>Describe the changes as humans develop to old age.</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, drugs and lifestyle on the way bodies function.</p> <p>Describe the way in which nutrients and water are transported within animals including humans.</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p> <p><b>Evolution and inheritance</b> 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>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology: Living Things and their Habitat	N/A	<p>Explore and compare the differences between things that are living, dead and things that have never been alive.</p> <p>Identify that most living things live in habitats that they are suited to.</p> <p>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 (inc. micro-habitats).</p> <p>Describe how animals get their food from plants and other animals (simple food chain).</p> <p>Identify and name different sources of food.</p>	N/A	<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 the local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life processes of reproduction in some plants and animals.</p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences (inc. micro-organisms, plants and animals).</p>
Chemistry: Materials	<p>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>Identify and compare the suitability of a variety of everyday materials (inc. wood, metal, plastic, glass, brick, rock, paper, cardboard) for certain uses.</p>	<p><b>Rocks</b> Compare/group rocks on their physical properties.</p> <p>Relate simple physical properties of some rocks to their formation (igneous/sedimentary)</p> <p>Describe how fossils are formed.</p> <p>Recognise that soils are made from rocks and organic matter to form igneous, sedimentary and metamorphic rock.</p>	<p><b>States of matter</b> Compare and group materials into solids, liquids and gases.</p> <p>Observe and explain that some materials change state when heated/cooled and measure temp in degrees Celsius. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p><b>Properties and changes of materials</b> Compare/group material based on comparative tests and fair tests (incl. hardness, solubility, conductivity and insulation, behaviour with magnets).</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular use of everyday materials (inc. wood, metal and plastic)</p> <p>Explain how 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 describe how mixtures might be separated (inc. through filtering, sieving and evaporating).</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 (inc. changes associated with burning and action of acid on bicarbonate of soda).</p>	N/A

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics: Light and Sound		<u>N/A</u>	<p><b>Light</b> Understand that light is reflected from surfaces.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object.</p> <p>Investigate and find patterns in the way the size of a shadow changes.</p>	<p><b>Sound</b> Identify and name how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>	<u>N/A</u>	<p><b>Light</b> 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 of from light sources to objects and then our eyes.</p> <p>Using the idea that light travels in straight lines, explain why shadows have the same shape as the object that cast them.</p> <p>Explain that light can be broken into colours and different colours can be combined to appear as a new colour.</p>
Physics: Earth and Space	<p><b>Seasonal Changes</b> Pupils should be taught to: Observe changes across the 4 seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>	<u>N/A</u>	<u>N/A</u>	<p>Explain that the sun is the center of our solar system.</p> <p>Discuss and understand the terms star, galaxy, milky way and universe.</p> <p>Identify the four seasons and link this to changes in sunlight and weather.</p> <p>Begin to understand the movement of the earth around the sun and the moons movement around the earth.</p>	<p>Describe the movement of 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>	<u>N/A</u>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics: Forces & Magnets	<u>N/A</u>	<u>N/A</u>	<p>Compare how things move on different surfaces (friction).</p> <p>Understand that some forces need contact between two objects and that magnetic forces can act at a distance.</p> <p>Explain the force of gravity.</p> <p>Explore push and pulls as a force.</p> <p><b>Magnets</b> Describe how magnets have two poles – one that attracts and one that repels.</p> <p>Predict and observe how magnets attract or repel each other and attract some materials and not others, depending on which poles are facing.</p> <p>Investigate the magnetic materials and know that magnets can work through materials.</p>	<u>N/A</u>	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity (drag force).</p> <p>Identify the effect of gravity, air resistance, water resistance and friction that act between moving surfaces. Know how to measure the size of a force using newtons.</p> <p>Recognise that some mechanisms (inc. levers, pulleys and gears) allow a smaller force to have a greater effect.</p>	<u>N/A</u>
Physics: Electricity	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<p>Identify common appliances that run on electricity.</p> <p>Construct a simple series circuit, identifying and naming its basic parts (inc. batteries, wires, bulbs, switches and buzzers).</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple circuit.</p> <p>Recognise that some common conductors and insulators and associate metals with being good conductors.</p>	<u>N/A</u>	<p>Associate the brightness of a lamp or the volume of a buzzer and the voltage of batteries (cells) used in the circuit.</p> <p>Compare and give reasons for variations in how components function (inc. the brightness of a bulb, loudness of buzzers and position of on/off switches).</p> <p>Use recognised symbols when representing a simple circuit diagram knowing the names of all components.</p> <p>Identify what causes a short circuit or a circuit to fuse.</p>



## SCIENCE OVERVIEW:

	Autumn		Spring		Summer	
<b>Year 1</b>	Animals Including Humans	Animals Including Humans	Material	Materials	Plants	Seasonal Changes
<b>Year 2</b>	Animals Including Humans	Animals Including Humans	Materials	Materials	Plants	Living Things and Their Habitats
<b>Year 3</b>	Magnets	Light	Materials – Rocks	Forces	Plants	Animals Including Humans
<b>Year 4</b>	Electricity	Sound	Materials: States of Matter		Animals including Humans	Living things and their Habitats
<b>Year 5</b>	Earth and Space	Forces and Magnets	Materials		Animals Including humans	Living Things and Their Habitats
<b>Year 6</b>	Electricity	Light	Evolutions and Inheritance	Evolutions and Inheritance	Animals Including Humans	Living Things and Their Habitats