



## HORNCastle PRIMARY SCHOOL

### Subject Progression – Science

<b>Purpose and Aims</b>	<p>Science has changed our lives and is vital to the world's future prosperity. We aim to ensure our children have a passion for science and its application in past, present and future technologies. Science encourages children to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. The science curriculum develops scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. It is vitally important children develop secure understanding of each key block of knowledge in order to progress to the next stage. Children are thus equipped with knowledge that enables them to understand the uses and implications of science today, and for the future. Excellent scientific knowledge will be presented through written and verbal explanations where children should be able to describe processes and key characteristics using the correct technical terminology. Spoken language is an important part of all National Curriculum subjects and in science children are taught scientific vocabulary so they can articulate concepts clearly and precisely. Throughout learning in science, embedded within all content (biology, chemistry and physics), children's ability to 'work scientifically' is fundamental. Children should develop an understanding of the nature, processes and methods of science using different kinds of scientific enquiries that help them to answer specific questions about the world around them. The opportunity to work practically in a variety of contexts, including fieldwork, underpins most learning.</p>
<b>EYFS</b>	<p>In order for children to operate as successful scientists, they are taught a wide range of essential enquiry skills. These begin in early child development with open opportunities to play, explore, create and engage in active learning, as well as becoming critical thinkers. Science offers young children the opportunity to ask questions and develop a curiosity about their environment. As they grow, they encounter new ways to explore and measure; this all stems from the questioning skills that they develop. It is vital that children are given the opportunity to explore these areas over time, as this exposure prompts them to naturally develop an inquisitive mind.</p> <p>During EYFS, children are encouraged to think carefully about their bodies, in particular, the ways that they can maintain good health. Children think about the physical effects that certain things have upon themselves, such as exercise, sleeping, hygiene and a healthy diet. They look at the roles that each of these practices have upon their health and safety. Also, children in EYFS will have an exposure to different environments, meaning that young children develop familiarities with multiple areas, rather than just the place they live. They begin to question and comment on different aspects of an environment and talk about some of the things they have observed. Their understanding of plants, animals, natural/found objects, places and materials will grow through the experiences they have around them and they will begin to suggest some similarities and differences within these categories. Through the use of their senses, children begin to notice that materials have different textures.</p> <p>By the end of the Foundation Stage, most children will be able to:</p> <ul style="list-style-type: none"> <li>- Talk about being healthy and safe</li> <li>- Understand why healthy living is important including why we exercise and have a healthy diet</li> <li>- Talk about their own environment and compare it to a contrasting environment</li> <li>- Talk about similarities and differences in relation to places, object, materials and living things</li> </ul>

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Focus Areas</b>		<b>Animals &amp; Humans</b> <b>Uses of Everyday Materials</b> <b>Plants</b> <b>Seasonal Changes</b>	<b>Living Things &amp; Their Habitats</b> <b>Plants</b> <b>Uses of Everyday Materials</b> <b>Animals &amp; Humans</b>	<b>Plants</b> <b>Rocks</b> <b>Forces &amp; Magnets</b> <b>Animals &amp; Humans</b> <b>Light</b>	<b>Sound</b> <b>Electricity</b> <b>States of Matter</b> <b>Animals &amp; Humans</b> <b>Living Things &amp; Their Habitats</b>	<b>Forces</b> <b>Living Things &amp; Their Habitats</b> <b>Animals &amp; Humans</b> <b>Properties &amp; Changes of Materials</b> <b>Earth &amp; Space</b>	<b>Light</b> <b>Living Things &amp; Their Habitats</b> <b>Animals &amp; Humans</b> <b>Evolution &amp; Inheritance</b> <b>Electricity</b>
<b>Significant Scientists</b>		Joseph Banks (plants) Greta Thunberg (seasonal changes)	John Dunlop (materials) Charles Macintosh (materials) Elizabeth Blackwell (plants)	Thomas Edison (Light) Isaac Newton (Forces) Etheldred Benett (rocks)	Alexander Graham Bell (Sound) Anders Celsius (States of matter) Antoine Lavoisier (States of Matter)	David Attenborough (Living things) Jane Goodall (Living things) Mae Jemison (Earth and Space) Zhang Heng (Earth and Space)	Charles Darwin (Evolution) Mary Anning (Evolution) Linnaeus (Classification) Aristotle (Classification)
<b>RSE Objective links</b>		Explain why I think my body is amazing and identify some ways to keep it safe and healthy.  Recognise how being healthy helps you to feel happy.  To identify healthy and unhealthy foods.	Express how it feels to share healthy food with friends.  To identify elements of a healthy diet.  To understand wat affects their food choices (Geography, personal taste, environment, money and social status)	To understand the principles of planning and preparing a range of healthy meals.  Make some healthy snacks and explain why they are good for the body.	To understand the principles of planning and preparing a range of healthy meals.	Describe the different roles food can play in people's lives and can explain how people can develop eating problems (disorders) relating to body image pressures.  Explain how they expect and value their body To identify the elements of a poor diet.  To know the risks associated with unhealthy eating habits, including the importance of calories	Evaluate when alcohol is being used responsibly, anti-socially or being misused  Explain how they feel about using alcohol when they are older and their reasons for this.
<b>Skills Progression – Working Scientifically</b>	<b>Ideas &amp; Evidence</b>	to ask simple questions	to ask simple questions and recognise that they can be answered in different ways	to ask relevant questions	to ask relevant questions and use different types of scientific enquiries to answer them.	to consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas and explanations for phenomena	to consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas and explanations for phenomena
	<b>Planning a test</b>	to begin to say what they think will happen eg. "I think that..." to test ideas suggested to them	to suggest some ideas and questions based on simple knowledge and say how they might find out about them  to say what they think will happen to think about and discuss whether comparisons and tests are fair or unfair	to suggest questions and ideas, and how to test them  to make predictions about what will happen and why this might happen to consider what makes a test unfair or evidence sufficient with help, to plan a fair test with help, plan a comparative test	to suggest questions that can be tested  to make predictions about what will happen, some of which are based on scientific knowledge to recognise when to use a fair test and design a fair test (identifying variables) to recognise when to use a comparative test to answer a question	to make predictions of what will happen based on scientific knowledge and understanding, and suggest how to test these  to plan comparative and fair tests	to plan enquiries, including recognising and controlling variables where necessary to use test results to make predictions to set up further comparative and fair tests  to choose what evidence to collect to investigate a question, ensuring the evidence is sufficient

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Skills Progression – Working Scientifically	Obtaining & presenting Evidence	<p>to perform simple tests</p> <p>to identify and classify</p> <p>to make observations using appropriate senses</p> <p>to make some measurements using non-standard measures</p> <p>to present some findings in simple (given) tables or a tally chart</p> <p>Collect data to help answer questions.</p>	<p>to perform simple tests</p> <p>to identify and classify</p> <p>to make observations using senses and simple equipment</p> <p>to choose equipment to take measurements, beginning to use standard measures</p> <p>to present results in simple tables, drawings and simple bar graphs or pictograms</p> <p>Gather and record data to help answer questions.</p>	<p>to make careful observations and comparisons</p> <p>to make accurate measurements using standard units</p> <p>to gather, record and classify data.</p> <p>to present results in drawings, tables and bar graphs or pictograms independently but as directed</p>	<p>to make systematic and careful observations and comparisons of relevant features in a variety of contexts</p> <p>to make accurate measurements choosing standard units and using a range of equipment</p> <p>to gather, record and classify data.</p> <p>to present results in an appropriate way, eg. using labelled diagrams, in tables and bar graphs independently</p> <p>to report on findings from enquiries using oral or written explanation</p>	<p>to make relevant observations and measurements with increasing accuracy</p> <p>to record data and results using diagrams, classification keys, tables and bar and line graphs</p>	<p>to make a variety of relevant observations and measurements using scientific equipment with increasing accuracy and precision</p> <p>to decide when observations and measurements need to be checked, by repeating to give more reliable data</p> <p>to record data and results using all previous methods and, in addition, models</p>
	Considering Evidence & Evaluating	<p>to communicate observations orally, by labelling and in simple writing</p> <p>in some cases to say what their observations show, and whether it was what they expected</p> <p>to draw simple conclusions and explain what they did</p> <p>Use the surrounding environment to help with observations.</p>	<p>to say what results show</p> <p>to say whether their predictions were supported</p> <p>in some cases to use knowledge to explain what was found out and to draw conclusions</p> <p>to explain what they did</p> <p>to use observations to suggest answers to questions.</p>	<p>to draw simple conclusions from results</p> <p>to make generalisations and begin to identify simple patterns in results presented in tables.</p> <p>to identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>to explain what the evidence shows and whether it supports any prediction made</p>	<p>to draw conclusions, suggesting improvements, new questions and predictions for setting up further tests</p> <p>to identify simple trends and patterns in results presented in tables and bar graphs</p> <p>to identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>to suggest explanations for some of these</p> <p>to link the evidence to scientific knowledge and understanding to answer questions and support findings</p>	<p>to recognise and make predictions from patterns in data and suggest explanations for these using scientific knowledge and understanding</p> <p>to identify patterns in results and results that do not appear to fit the pattern</p> <p>to interpret data and decide whether it is sufficient to draw conclusions</p> <p>to draw conclusions indicating whether these match any prediction made</p>	<p>to report findings and draw conclusions, including explanations involving causal relationships</p> <p>to use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>to use results to draw conclusions and make further predictions</p>

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Biology	<p>to identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen</p> <p>to identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.</p> <p>to identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates</p> <p>to identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>to describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets)</p> <p>to identify name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>	<p>to observe and describe how seeds and bulbs grow into mature plants</p> <p>to find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p> <p>to notice that animals, including humans, have offspring which grow into adults</p> <p>to investigate and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>to describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene</p> <p>to explore and compare the differences between things that are living, that are dead and that have never been alive.</p> <p>to 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</p> <p>to identify and name a variety of plants and animals in their habitats, including micro-habitats</p> <p>to 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</p>	<p>to identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers</p> <p>to explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</p> <p>to investigate the way in which water is transported within plants</p> <p>to explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p> <p>to identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat.</p> <p>to identify that humans and some animals have skeletons and muscles for support, protection and movement</p>	<p>to describe the simple functions of the basic parts of the digestive system in humans</p> <p>to identify the different types of teeth in humans and their simple functions.</p> <p>to construct and interpret a variety of food chains, identifying producers, predators and prey</p> <p>to identify and name a variety of living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups</p> <p>to give reasons for classifying plants and animals based on specific characteristics</p> <p>to recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats</p>	<p>to describe the life cycles common to a variety of animals, including humans (birth, growth, development, reproduction, death), and to a variety of plants (growth, reproduction and death)</p> <p>to describe the life process of reproduction in some plants and animals</p> <p>to describe the changes as humans develop from birth to old age</p>	<p>to describe how adaptation leads to evolution</p> <p>to 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>identify how animals and plants are suited to and adapt to their environment in different ways</p> <p>to recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>to recognise how and why the human skeleton has changed over time, since we separated from other primates</p> <p>to describe the ways in which nutrients and water are transported within animals, including humans</p> <p>to explain the classification of living things into broad groups according to common, observable characteristics and differences, including plants, animals and micro-organisms</p> <p>to identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood (including the pulse and clotting)</p> <p>to recognise the impact of diet, exercise, drugs and lifestyle on the way human bodies function</p>

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Chemistry	<p>to distinguish between an object and the material from which it is made</p> <p>to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock</p> <p>to describe the simple physical properties of a variety of everyday materials</p> <p>to compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p>to find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p> <p>to identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard</p>	<p>to compare and group together different kinds of rocks on the basis of their simple, physical properties</p> <p>to describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock</p> <p>to recognise that soils are made from rocks and organic matter</p>	<p>to compare and group materials together, according to whether they are solids, liquids or gases</p> <p>to observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics</p> <p>to identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p>to compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets</p> <p>to understand how some materials will dissolve in liquid to form a solution</p> <p>to use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>to give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials</p> <p>to demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>to 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, oxidation and the action of acid on bicarbonate of soda</p>	No content listed in National Curriculum for Y6

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Physics	<p>to observe changes across the four seasons</p> <p>to observe and describe weather associated with the seasons and how day length varies</p>	No content listed in National Curriculum for Y2	<p>to compare how different things move on different surfaces</p> <p>to notice that some forces need contact between two objects but magnetic forces act at a distance</p> <p>to observe how magnets attract or repel each other and attract some materials and not others</p> <p>to observe the apparent movement of the Sun during the day</p> <p>to describe magnets as having two poles</p> <p>to predict whether two magnets will attract or repel each other, depending on which poles are facing</p> <p>to compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials</p> <p>to recognise that we need light in order to see things and that darkness is the absence of light</p> <p>to observe and name a variety of sources of light, including electric lights, flames and the Sun, explaining that we see things because light travels from them to our eyes</p> <p>to notice that light is reflected from surfaces</p> <p>to recognise that light from the sun can be dangerous and that there are ways to protect our eyes</p> <p>to associate shadows with a light source being blocked by something; find patterns that determine the size of shadows</p>	<p>to observe and name a variety of sources of sound, noticing that we hear with our ears</p> <p>to identify how sounds are made, associating some of them with something vibrating</p> <p>to recognise that vibrations from sounds travel through a medium to the ear</p> <p>to recognise that sounds get fainter as the distance from the sound's source increases</p> <p>find patterns between the pitch of a sound and features of the object that produced it</p> <p>find patterns in the volume of sound and the strength of the vibrations that produced it</p> <p>to identify common appliances that run on electricity</p> <p>to construct a simple series electrical circuit, identifying and naming its basic parts (cells, wires, bulbs, switches and buzzers)</p> <p>to identify whether or not a lamp will light in a simple series circuit based on whether or not the lamp is part of a complete loop with a battery</p> <p>to recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>to recognise some common conductors and insulators and associate metals with being good conductors</p>	<p>to explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>to identify the effect of drag forces, such as air resistance, water resistance and friction that act between moving surfaces</p> <p>to describe, in terms of drag forces, why moving objects that are not driven tend to slow down</p> <p>to understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs</p> <p>to observe the apparent movement of the Sun during the day and observe changes across the four seasons, how day length varies</p> <p>to describe the movement of the Earth relative to the Sun in the solar system</p> <p>to describe the movement of the Moon relative</p> <p>to describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>to use the idea of the Earth's rotation to explain day and night</p> <p>to investigate the way that ideas of the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus</p>	<p>to understand that light appears to travel in straight lines</p> <p>to use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyes.</p> <p>to use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes.</p> <p>to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>to compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>to use recognised symbols when representing a simple circuit in a diagram</p>