Pirbright Village Primary School
Progression of Knowledge & Skills in SCIENCE

Subject Intent	As a school, we strive to develop curious Scientists, through engaging and memorable learning experiences; they should leave feeling confident with not only their Scientific knowledge and vocabulary, but the ability to ask questions and investigate, using their disciplinary skills.

National Curriculum KS1	**National Curriculum Lower KS2**	**National Curriculum Upper KS2**
• Enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. • Be curious and ask questions about what they notice. • Develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. • Use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. • Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.	• Enable pupils to broaden their scientific view of the world around them. • They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. • Ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. • Draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.	• Enable pupils to develop a deeper understanding of a wide range of scientific ideas. • They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. • Encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. • Recognise that scientific ideas change and develop over time. • Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. • Draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
Progression of Skills		

EYFS	• I can name and sort objects and talk about my sorting • I can describe what I can see, hear & feel whilst exploring and investigating outside. • I can notice & discuss patterns around me.
Year 1	• I can perform simple tests • I can name and sort objects and talk about my sorting • I can make observations using simple tools
Year 2	• I can ask simple questions and try to answer them in different ways • I can gather and record data to help answer my questions • I can use my observations to try and answer my questions
Year 3	• I can ask relevant questions and set up different investigations to answer them • I can make careful and systematic observations • I can use equipment like thermometers and data loggers to take measurements in standard units • I can present my data in different ways to help me answer my questions • I can use my evidence to answer my questions or prove my ideas • I can talk about the differences and similarities between scientific ideas
Year 4	• I can set up experiments ensuring they are fair tests • I can explain what a fair test is • I can make careful and systematic observations • I can use equipment like thermometers and data loggers to take measurements in standard units • I can record my results in a range of ways (including bar charts, drawings, labelled diagrams and tables), using scientific language • I can make conclusions and new predictions from my results • I can report my conclusions using displays, oral or written explanations • I can evaluate how effective my experiment was and think about further questions I could ask
Year 5	• I can plan my experiments in detail • I can consider variables and plan ways to control nuisance variables • I can use scientific equipment accurately to take readings • I can take and effectively record repeated readings accurately • I can use diagrams, labels, classification keys, tables, bar and line graphs and scatter graphs to record my data • I can consider all the evidence carefully to make conclusions • I can explain how my findings either support or disprove my ideas
Year 6	• I can plan my experiments in detail. • I can consider independent and dependent variables. • I can use scientific equipment accurately to take readings. • I can take and effectively record repeated readings accurately. • I can use diagrams, labels, classification keys, tables, bar and line graphs and scatter graphs to record my data. • I can use my findings to set up other experiments, ensuring they are fair tests.

	• I can present my findings and use these to make clear conclusions. • I can present clear explanations about causal relationships in my findings. • I can explain whether or not my findings are trustworthy, considering the effects of anomalies on my experiment.

EYFS		
Autumn	**Spring**	**Summer**
	• To know that all plants need water, light and warmth as well as nutrients in the soil to grow and survive. • To name, describe and draw pictures of some plants. • To know that a seed produces roots to allow water to get into the plant and shoots to produce leaves to collects the sunlight. • To explore how magnets attract and repel different objects. • To know that temperature can change materials in both reversible (melting chocolate) and irreversible ways (popcorn).	• To know that animals change as they grow and have life cycles. • To know and can apply the correct terms and vocabulary e.g. chrysalis, when observing the lifecycle of butterflies • To know how to respect and care for the natural environment. • To know how to care for living things. • To know how to care for an animal or pet. • To be able to make observational drawings of the natural world.
• To know there are 4 seasons across the year. • To be able talk about what I can hear, smell, see and feel (on seasonal walks) and represent what I have seen through drawings or discussions. • To know the days of the week and some of the months of the year and recognise the associated weather changes. • To know a range of words that relate to scientific enquiry such as observe, explore, results, investigate, explain, predict. • To be able to name a range of equipment such as a pipette, magnifying glass, • To know that some specialist equipment can help us to understand the natural world (and enhance our experience) for example a microscope.		

Year 1		
Autumn	**Spring**	**Summer**
Earth, Wind & Fire	**Far, Far Away**	**Nurturing Nature**
• To be able to make verbal predictions with reasons including 'because'. • To be able to identify parts of the body. • To link the parts of the body associated with each sense.	• To describe and classify objects by their material and understand the materials in terms of physical properties. • To make predictions and learn about fair tests when investigating floating and sinking.	• To know the characteristics of spring /summer and how trees affected by the current season. • To know how plants start from seeds and to label the key features of flowering plants.

• To name the four seasons and know the characteristics of weather associated with autumn/winter. • To use a weather diary and a rain gauge. • To know how a tree is affected by the current season dependent on whether it is deciduous or evergreen.	• To make predictions and learn about fair tests when investigating insulation. • To observe changes and record results and understand that our results help us come to a conclusion. • To know the characteristics of winter/spring and how trees are affected by the current season. • To know how the size of wings impacts the distance a paper aeroplane travels.	• To know the difference between herbivores, omnivores & carnivores. • To know the key features and structures of birds, reptiles, amphibians, mammals and fish and understand how we classify animals.
Year 2		
Autumn	**Spring**	**Summer**
Passports to the World	**Living, Dead and Never Been Alive**	**Victorians**
• To name some everyday materials and their properties. • To know whether the shape of materials can be changed. • To be able to identify and sort Australian animals • To know features of the Savanna as a habitat and its suitability for the variety of animals that live there.	• To know the difference between living, dead and never been living. • To understand what a fossil is. • To know the key things something needs to do to be a living thing: move, grow, reproduce, breathe, get rid of waste. • To know the 3 basic needs of animals, including humans: air, water, food. • To understand what a food chain is • To know the importance of exercise, nutrition and hygiene.	• To know the names of common flowering plants and the names of common trees by identifying their leaves • To know the parts of a tree: leaves, branches, bark, crown, trunk, roots. • To know the job each part of the tree has. • To understand the difference between a seed and a bulb, also what is inside a seed and what is inside a bulb. • To observe seeds and bulbs growing into mature plants. • To understand that plants need water, light and a suitable temperature to grow.
Year 3		
Autumn	**Spring**	**Summer**
Clubs and Cavemen	**Exhilarating Egyptians**	**Engaging Environment**
Rocks & Soils / Light	**Animals Including Humans**	**Plants / Forces**
• To identify sources of light and recognise that the moon is not a light source. • To know that darkness is the absence of light. • To know that we see things because of light reflecting from surfaces.	• To know that soil is different, depending on where it is located. • To know what makes a healthy diet and where nutrition comes from. • To know why we have a skeleton and muscles.	• To know that 'biodiversity' means all the plants and animals that live in different environments around the world. • To know the way in which water is transported within plants.

• To know how to stay safe and not look at the sun. • To understand how shadows are formed and identify patterns in the way the size of shadows change. • To know how rocks are formed and identify, describe and group rock • To know the function of parts of a plant. • To know that things move differently on different surfaces.	• To know types of skeleton - vertebrates / invertebrates / endo- / exo.	• To understand the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. • To know the requirements for life and growth in plants. • To know magnets have two poles and that magnetics can attract or repel each other based on their poles • To know magnetic forces can act from a distance while other forces require contact • To know and name magnetic materials.

<table>
<tr><th colspan="3">Year 4</th></tr>
<tr><th colspan="2">Autumn</th><th colspan="2">Spring</th><th>Summer</th></tr>
<tr><th>Cracking Contraptions</th><th>Extreme Earth</th><th>Are All Animals The Same?</th><th>Myths and Legends</th><th>Should We Thank The Romans For Invading Britain?</th></tr>
<tr>
<td colspan="2">• To group materials as solids, liquids or gases according to their properties and the way they behave. (Including how some solids behave like liquids.)
• To observe how materials change state when heated or cooled and know that this happens at different temperatures.
• To understand the roles of evaporation and condensation in the water cycle and how temperature affects evaporation.
• To identify common appliances that use electricity.
• To build and recognise simple series circuits, name their parts, and understand that a complete loop is needed for a lamp to light.
• To identify when circuits won't work and why.
• To know what a switch does in a circuit
• To investigate conductors and insulators, understanding that metals are good conductors.</td>
<td colspan="2">• To recognise that living things can be grouped in a variety of ways, exploring methods of classification and using classification keys.
• To know what a food chain is and how these relate to food webs within a habitat.
• To know the arrows in a food chain represent the transfer of energy and to identify producers, predators and prey.
• To know what deforestation means, its impact on living things, and how this is an example of how environments change.
• To describe the simple functions of the basic parts of the digestive system in humans and label parts of the digestive system.
• To identify the different types of teeth in humans and their simple functions (DEAL conclusion) and to understand what happens to a tooth when it is not cleaned properly; the causes of tooth decay.</td>
<td>• To know how sounds are made with vibrations
• To be able to name the parts of the ear and explain how vibrations travel through the ear and into the brain.
• To understand the terms 'pitch' and 'volume' and draw the sound waves for both pitch and volume.
• To know the types of material through which sound travels (DEAL conclusion)
• To understand how distance affects the loudness of sound</td>
</tr>
<tr><th colspan="3">Year 5</th></tr>
<tr><th colspan="2">Autumn</th><th colspan="2">Spring</th><th>Summer</th></tr>
<tr><th colspan="2">To Infinity and Beyond & In Your Imagination</th><th colspan="2">Journey Around the World & The Diversity of Life</th><th>Raiders & Invaders</th></tr>
<tr>
<td colspan="2">• To describe the Sun, Earth and Moon as approximately spherical bodies and their relative sizes.</td>
<td colspan="2">• To know what water resistance is and up thrust.</td>
<td>• To understand changes that happen between birth and adulthood in humans</td>
</tr>
</table>

• To know the movement of the Earth, and other planets, relative to the Sun in the Solar System and the difference between rotation and revolution. • To know The Earth takes 24 hours to spin on its axis in an anticlockwise direction and this is how day and night occur. • To know that the moon takes approximately 28 days to orbit the Earth and that the moon changes its appearance during a month. • To know that we have seasons because of the tilt of the Earth's axis. • To know the process of sexual reproduction in animals and the two main ways in which fertilisation occurs in animals. • To be able to describe and compare the life cycle of a mammal, a bird, a frog and a butterfly. • To know the meaning of dissolving, solutions, filtering/sieving and evaporating and be able to name reversible and irreversible changes.	• To know the effect of friction when moving on different surfaces • To know what gravity is. • To know what air resistance is.	and how our bodies change as we get older. • To know how to group and compare different materials on the basis of their properties and uses. • To know that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Year 6		
Autumn	**Spring**	**Summer**
To Be A Child In WWII	**Celebrating Me!**	**Visit To Central & South America**
• To be able to name the 5 different types of microorganisms, and know examples of each of them and how they are classified into groups. • To know how microorganisms, contribute to food decay and what environment and conditions contribute to mould growth.	• To know that fossils provide us with clues of the past, how different fossils are formed and the difference between cast fossil, mould fossil & amber fossil. • To know the function of the heart and the lungs and describe their features. • To know the function of the blood (transporting nutrients and water) and its composition.	• To know who Charles Darwin is and understand the importance of his research into evolution. • To know that living things have evolved over time. • To know that some characteristics are inherited and that animals can be bred based on the desirability of characteristics, while others have naturally evolved to adapt to their environments.

• To know how to make a bulb shine brighter or a buzzer louder by adapting the power of the battery. • To know how to use circuit symbols and draw circuits accurately. • To know how to troubleshoot and repair circuits. • To apply knowledge of electrical circuits to construct a Morse code machine using switches.	• To understand the effects of exercise on the body. • To know the effects of sugar, drugs and alcohol on the body. • To know that light travels in a straight line, and that a periscope can be used to manipulate the direction of light. • To know how the eye uses light to see things, and know the anatomy of the eye. • To know what shadows are and how shadows form.	• To be able to use a branching database to classify animals and plants.