Warbstow Primary Academy and Nursery

SCIENCE WHOLE SCHOOL PROGRESSION

KS1 Programme of Study The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to 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. They should begin to 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.	**KS2 Programme of Study** LKS2 - The principal focus of science teaching in lower key stage 2 is to 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. They should 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. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. UKS2 - The principal focus of science teaching in upper key stage 2 is to 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. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should 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. Pupils should 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.

EYFS Programme Understanding the World

ELG: The Natural World

- Explore the natural world around them – observe and interact with natural processes
- Describe what they see, hear and feel – commenting on things they have seen whilst outside, including plants and animals
- Understand the effect of changing seasons on the natural world around them

	Foundation **Sequence towards KS1**	**KS1** **Sequence towards KS1**	**Lower KS2** **Sequence towards Upper KS2**	**KS2**
Animals including humans	• Children know about similarities and differences in relation to living things • They make observations and drawings of living things and explain why some things occur, and talk about changes • Know about similarities and differences in relation to living things • Explore the natural world around them	• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (Y1) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores (Y1) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) (Y1) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense (Y1) • Notice that animals, including humans, have offspring which grow into adults (Y2) • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) (Y2) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene (Y2)	• 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 (Y3) • Identify that humans and some other animals have skeletons and muscles for support, protection and movement (Y3) • Describe the simple functions of the basic parts of the digestive system in humans (Y4) • Identify the different types of teeth in humans and their simple functions (Y4) • Construct and interpret a variety of food chains, identifying producers, predators and prey (Y4)	• Describe the changes as humans develop to old age (Y5) • Identify and name the main parts of the circulatory system, and describe the functions of the heart, blood vessels and blood (Y6) • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function (Y6) • Describe the ways in which nutrients and water are transported within animals, including humans (Y6)

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Plants	• Make observations and drawings of plants and explain why some things occur, and talk about changes • They talk about the features of their own immediate environment and how environments may vary from one another • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class	• Identify and name common wild and garden plants, including deciduous and evergreen trees (Y1) • Identify and describe the basic structure of a variety of common flowering plants, including trees (Y1) • Observe and describe how plants need water, light and suitable temperature to grow into mature plants (Y2) • Find out and describe how plants need water, light and suitable temperature to grow and stay healthy and how changing these affects the plant (Y2)	• Identify, locate and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • 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 • Investigate the way in which water is transported within plants • Explore the part that plants play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	•
Everyday materials	• Children know about similarities and differences in relation to objects and materials • They make observations and explain why some things occur, and talk about changes • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter	• Distinguish between an object and the material from which it is made (Y1) • Identify and name a variety of everyday materials including wood, plastic, glass, metal, water, rock, brick, paper, cardboard (Y1) • Describe the simple physical properties of a variety of everyday materials (Y1) • Compare and group together a variety of everyday materials on the basis of their simple physical properties (Y1) • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, water, rock, paper and cardboard for particular uses (Y2) • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching (applying a force) (Y2)		
Properties and changes of materials	•	•		• Compare and group together everyday materials based on their properties, including their hardness, suitability, transparency, conductivity (electrical and thermal), and response to magnets • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, fo the particular uses of everyday materials, including metals, wood and plastic • Demonstrate that dissolving, mixing and changes of state are reversible changes

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				• Explain that some changes result in the formation of new materials, and that this is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda (Y5)
Seasonal changes	• Children know about similarities and differences in relation to places • Talk about the features of their immediate environment and how environments might vary from one another • Make observations and explain why some things occur and talk about changes	• Observe changes across the four seasons (Y1) • Observe and describe weather associated with the seasons and how day length varies (Y1)		
Living Things and Their Habitats	•	• Explore and compare differences between things that are living, dead and things that have never been alive • 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. • Identify and name a variety of plants and animals in their habitats, including micro-habitats • 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 (Y2)	• Recognise that living things can be grouped in a variety of ways • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • Construct and interpret a variety of food chains, identifying producers, predators and prey • Recognise that environments can change and this can sometimes pose dangers to living things (Y4)	• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (Y5) • Describe the life processes of reproduction in some plants and animals (Y5) • 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 (Y6) • Give reasons for classifying plants and animals based on specific characteristics (Y6)
Rocks			• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • Describe in simple terms how fossils are formed when things that have lived are trapped within rock • Recognise that soils are made from rocks and organic matter (Y3)	
Light			• Recognise that we 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 our eyes • Recognise that shadows are formed when the light from a light source is blocked by a solid object • Find patterns in the way that the size of shadows can change (Y3)	• Recognise that light appears to travel in straight lines • 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 • 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 • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them (Y6)
Forces and magnets			• Compare how some things move on different surfaces	• Explain that unsupported objects fall towards Earth because of the force of gravity acting between the Earth and the falling object

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			• Notice that some forces need contact between tow objects but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • Compare and group together a variety of everyday materials on the basis whether they are attracted to a magnet, and identify some magnetic materials • Describe magnets as having two poles • Predict whether tow magnets will attract or repel each other, depending on which poles are facing (Y3)	• Identify the effects of air resistance, water resistance and friction that act between moving surfaces • Friction, air resistance and water resistance are forces which slow down moving objects (Y5)
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 • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature (Y4)	
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 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 (Y4)	
Electricity			• Identify common appliances that run on electricity • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • 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 • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • Recognise some common conductors and insulators, and associate metals with being good conductors (Y4)	• 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 • Use recognised symbols (cells, wires, switches, bulbs, buzzers and motors) when representing a simple circuit in a diagram (Y6)
Earth and Space				• Describe the movement of the Earth, and the other planets, relative to the Sun in the solar system • Describe the movement of the Moon relative to the Earth

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				• Describe the sun, earth and moon as approximately spherical bodies • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky (Y5)
Evolution and inheritance				• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution (Y6)
Being a scientist		• Draw simple pictures • Talk about what they see and do, describe observations using scientific vocabulary • Use simple texts to find information • Ask questions • Use charts to communicate findings • Test ideas suggested and say what they think will happen • Use first hand experiences to answer questions • Use simple observational equipment • Begin to recognise when a test or comparison is unfair • Make comparisons eg objects and living things • Suggest how they could collect data to answer questions • Begin to select equipment from an appropriate range • Say what has happened, saying what the observations show • Say whether what has happened was what they expected • Begin to draw simple conclusions • Begin to suggest improvements to their work	• Use pictures, writing, diagrams and tables to communicate information/observations/findings • Select the appropriate format to record observations • Make a series of observations • Use more complex texts to find information • Begin to plot simple graphs • Use scientific language • Put forward own ideas for how to find answers to questions • Recognise the need to collect data to answer questions • Begin to realise that scientific ideas are based on evidence • Begin to vary one factor in their investigation while keeping others the same • Predict outcomes using previous experience and knowledge, compare with actual results • Carry out a fair test and understand why • Decide on an approach in their own investigations • Select appropriate equipment • Carry out accurate measurements • Begin to offer explanations for what they observe and communicate in a scientific way • Relate conclusions to scientific knowledge and understanding • Identify patterns in recorded measurements • Evaluate their findings and suggest improvements to their work	• Make and record observations systematically and with increasing precision, making enough for the task • Use appropriate scientific language and conventions to communicate information, quantitative and qualitative data • Select a range of appropriate sources of information, gathering information • Represent data on graphs, choosing appropriate scales • Explain anomalous data and offer explanations • Use previous knowledge and experience combined with experimental evidence to provide scientific explanations • Use scientific language to identify an approach for an investigation • Formulate new ideas based on the interpretation of results • Make predictions based on scientific knowledge and understanding • Recognise the key factors to be considered in carrying out a fair test • Select apparatus for a range of tasks, using it to make careful observations and measurements • Measure quantities with precision using scale divisions • Draw conclusions that are consistent with evidence, relate to scientific knowledge • Explain conclusions scientifically • Make reasoned suggestions on how to improve working methods

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