



Subject Information:

Science Education at Oxenhope C of E
Primary School

How we teach Science at Oxenhope C of E Primary School

Subject Intent

What do we want to achieve with our Science curriculum?

At Oxenhope we develop our children to observe phenomena, looking closely at the world around them. We encourage the natural curiosity of our children and inspire them to ask questions about what they notice. The children are given opportunity to enquire in a scientific manner, use scientific language and learn through practical hands on experiences.

As the children grow themselves so does their scientific view of the world around them. They will discover this world through exploring, talking, testing and developing ideas about their familiar surroundings. The children are exposed to scientific enquiry and will start to develop ideas about the types of enquiry they will use to answer questions.

Through building up a body of key foundational knowledge and concepts, children are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. Our science curriculum, which follows the National Curriculum, encourages children to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Subject Implementation

Our enquiry-based science curriculum aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- 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
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

The focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at 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. 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.

The 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 be beginning to develop their ideas and 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 if answering them.

The focus of science teaching in upper key stage 2 is to enable pupils 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. 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.

Each science unit is based on an overarching question, with additional learning questions providing a focus for each session. Where possible each unit begins with a hook to engage learners and spark their interests.

Our assessment of science is robust, as we use the progression statements below to support both planning and assessment within each year group.

Subject Impact

Learners will:

- know more, remember more and understand more about science
- inspire learners to have a curiosity and fascination about the world
- children are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena
- develop and confidently use a range of scientific skills such as observation and measurement to explain what is occurring, predict how things will behave, and analyse causes
- Many learners will achieve or exceed age related expectations in Science

The Science Curriculum at a Glance – Years 1 -6

Plants	Animals, including humans	Everyday materials and their uses. Properties and changes	Seasonal changes	Living things and their habitats	Rocks	Light	Forces and Magnets	States of Matter	Sound	Electricity	Earth and Space	Forces	Evolution and inheritance
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	Working scientifically	Term 1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
Rec	<ul style="list-style-type: none"> Notices and comments on change in their environment, outdoors Asks questions about what they have observed Uses appropriate resources to carry out chosen test Formulates a hypothesis about what they think will happen and why Plans a test - considering what it is that they want to find out Thinks about how they can find out the answer to their question Closely observes experiments over several days Discusses what their observations tell them Seeks out things to observe to find things out Records their findings in their own way Makes decisions about what will be the most effective 	<ul style="list-style-type: none"> Know basic care for plants e.g. watering Understand the need for care and respect towards animals Identify a healthy snack Know that brushing teeth is important Talks in detail about features of own and immediate environment Make observations about the environment in Autumn and Winter Know the weather associated with Autumn and Winter Understand the process of freezing and melting Make observations of different materials and identify their properties 		<ul style="list-style-type: none"> Understand the basics of what a plant needs to grow: water, soil and sunlight Understand simple life cycles – plant Understand how animals are adapted to live in different places e.g. polar bear Understand simple life cycles – animal Know that exercise is healthy Know that it is important to have good health and a healthy diet Know how to keep teeth healthy and why it is important Identify the habitat of some animals Know about similarities and differences in relation to living things Make observations about the environment in Spring and Summer Know the weather associated with Spring and Summer Identify which materials float Know that materials have certain uses depending on their properties 		<ul style="list-style-type: none"> Make observations of plants Identify different parts of a plant including roots, stem, leaves and flower Make observations of animals and explain why somethings occur Understand how we can maintain a healthy lifestyle; exercise, healthy eating and dental care Begin to understand the effect of exercise on the human Talks about features of own and immediate environment and how environments vary from one another Know that the environment and living things are influenced by human activity Identify and compare the 4 seasons and weather associated with seasons Know about similarities and differences in relation to materials Understand why some materials float and sink with support 	

	<p>resources to use to carry out experiment</p> <ul style="list-style-type: none"> • Tests ideas and theories • Plans what they will do next based on their findings 						
Yr 1	<ul style="list-style-type: none"> • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions 	<p>Animals including humans</p> <ul style="list-style-type: none"> • 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>Seasonal changes</p> <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies 	<p>Animals including humans</p> <ul style="list-style-type: none"> • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores <p>Seasonal changes</p> <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies 	<p>Plants</p> <ul style="list-style-type: none"> • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees 	<p>Everyday materials</p> <ul style="list-style-type: none"> • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties 	<p>Seasonal changes</p> <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies 	<p>Animals including humans</p> <ul style="list-style-type: none"> • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores
Yr 2		<p>Animals including humans</p> <ul style="list-style-type: none"> • notice that animals, including humans, have offspring which 	<p>Use of everyday materials</p> <ul style="list-style-type: none"> • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials 	<p>Plants</p> <ul style="list-style-type: none"> • observe and describe how seeds and bulbs grow into mature plants • find out and describe how 	<p>Living things and their habitats (done Autumn 1)</p> <ul style="list-style-type: none"> • explore and compare the 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 		

		<p>grow into adults</p> <ul style="list-style-type: none"> find out about and describe the basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene 	<p>can be changed by squashing, bending, twisting and stretching</p> <p>Autumn 1 materials matter Spring 1 squash, bend twist stretch</p>	<p>plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>the basic needs of different kinds of animals and plants, and how they depend on each other</p> <ul style="list-style-type: none"> identify and name a variety of plants and animals in their habitats, including microhabitats 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>Spring 1 Habitats Spring 2 Garden and allotments</p>	
Yr 3	<ul style="list-style-type: none"> asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers gathering, recording, classifying and presenting data in a variety of ways to help in answering questions recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions 	<p>Forces and magnets</p> <ul style="list-style-type: none"> compare how things move on different surfaces notice that some forces need contact between 2 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 of whether they 	<p>Animals including humans</p> <ul style="list-style-type: none"> 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 identify that humans and some other animals have skeletons and muscles for support, protection and movement 	<p>Light</p> <ul style="list-style-type: none"> recognise that they 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 their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the 	<p>Rocks</p> <ul style="list-style-type: none"> 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 	<p>Plants</p> <ul style="list-style-type: none"> identify 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 flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

	<ul style="list-style-type: none"> • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings. 	<p>are attracted to a magnet, and identify some magnetic materials</p> <ul style="list-style-type: none"> • describe magnets as having 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing 		<p>size of shadows change</p>			
Yr 4		<p>What is a sound?</p> <ul style="list-style-type: none"> • 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 pitch of a sound and features of the object that produced it • 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 	<p>Animals including humans – where does our food go?</p> <ul style="list-style-type: none"> • describe the simple functions of the basic parts of the digestive system in humans 	<p>Animals including humans – How do animals survive?</p> <ul style="list-style-type: none"> • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey 	<p>Living things and their habitats – why is the sea important?</p> <ul style="list-style-type: none"> • 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 • recognise that environments can change and that this can sometimes pose dangers to living things 	<p>States of Matter – How do materials change temperature?</p> <ul style="list-style-type: none"> • 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 (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 	<p>Electricity – What is electricity and how does it work?</p> <ul style="list-style-type: none"> • 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

		source increases					<ul style="list-style-type: none"> recognise some common conductors and insulators, and associate metals with being good conductors
Yr 5	<ul style="list-style-type: none"> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs using test results to make predictions to set up further comparative and fair tests reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments 	Living things and their habitats <ul style="list-style-type: none"> describe the life process of reproduction in some plants and animals describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird 	Changes of material <ul style="list-style-type: none"> compare and group together everyday materials on the basis of their properties, including their hardness, solubility, 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, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes 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 and the action of acid on bicarbonate of soda 	Earth and Space <ul style="list-style-type: none"> describe the movement of the Earth and other planets relative to the sun in the solar system describe the movement of the moon relative to the Earth 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 	Animals including humans <ul style="list-style-type: none"> describe the changes as humans develop to old age 	Forces <ul style="list-style-type: none"> explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect 	
Yr 6		Animals including humans <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood 	Living things and their habitats <ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and 	Evolution and inheritance <ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things that 	Electricity <ul style="list-style-type: none"> 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 when representing a simple circuit in a diagram 	Light <ul style="list-style-type: none"> 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 	

		<p>vessels and blood</p> <ul style="list-style-type: none">• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function• describe the ways in which nutrients and water are transported within animals, including humans	<p>differences, including micro-organisms, plants and animals</p> <ul style="list-style-type: none">• give reasons for classifying plants and animals based on specific characteristics	<p>inhabited the Earth millions of years ago</p> <ul style="list-style-type: none">• 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		<p>they give out or reflect light into the eye</p> <ul style="list-style-type: none">• 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
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