

Curriculum Intent – Knowledge Builder

Science Key Stage 1 Curriculum

Subject Intent Statement KS1:

Science has changed our lives and is vital to the world's future prosperity. Our aim is to encourage pupils to recognise the power of scientific explanation and develop a sense of excitement and curiosity about natural phenomena. We seek to inspire in pupils' a curiosity and fascination about the world around them 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 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. We aim to develop knowledge and skills that are transferable to other curriculum areas and which can and are used to promote their spiritual, moral, social and cultural development.

Subject Intent Statement KS2:

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. 'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

Year 1	Year 2	Year 3	Year 4
<p>Key Knowledge:</p> <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 describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) 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>Pupils identify and become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets</p> <p>Pupils identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Pupils can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Pupils learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) and label parts of the body.</p> <p>Pupils name and explain the function of the 5 senses</p>	<p>Key Knowledge:</p> <p>Animals including humans</p> <ul style="list-style-type: none"> Pupils understand that animals including humans grow and have offspring. Pupils know the names of animals and their offspring and their life cycles Pupils describe basic needs for survival (water, food, air) Pupils describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. <p>Uses of everyday materials</p> <ul style="list-style-type: none"> Pupils identify and compare the properties and use of materials, Pupils find out how solid shapes can be changed by squashing, bending, twisting and stretching. <p>Plants</p> <ul style="list-style-type: none"> Pupils know about how light, water and temperature affect plants; they revise and develop plant knowledge from year 1 Pupils observe and describe how seeds and bulbs grow into mature plants. <p>Living things and their habitats</p> <ul style="list-style-type: none"> Pupils explore and compare differences between things that are living, dead, and never been alive. Pupils 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 	<p>Key Knowledge:</p> <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>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 	<p>Key Knowledge:</p> <p>Living things and their habitats</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>Animals including humans</p> <ul style="list-style-type: none"> describe the simple functions of the basic parts of the digestive system in humans 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>States of Matter</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>Everyday materials</p> <ul style="list-style-type: none"> • Pupils distinguish between an object and the material from which it is made. • Pupils identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • They can describe the simple physical properties of a variety of everyday materials. • Pupils compare and group together a variety of everyday materials on the basis of their simple physical properties. <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 structures of a variety of common flowering plants, including trees • Pupils identify and become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem, making a flower diagram <p>Seasonal changes</p> <ul style="list-style-type: none"> • Pupils observe changes across the four seasons. • Pupils describe the weather and temperature in different seasons and learn how the day length varies. <p>Know how to use big questions as the basis for investigation such as :</p> <p>What happens to trees throughout the seasons? Does the wind always blow in the same direction? What does my pet need to survive? What material would be best to fix the umbrella? Where do woodlice prefer to live?</p>	<p>of food.</p> <ul style="list-style-type: none"> • Pupils identify and name a variety of plants and animals in their habitats, including micro-habitats • Pupils 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>Know how to use big questions as the basis for investigation such as</p> <p>Why doesn't a panda live in Antarctica? Are the basic needs of a tiger the same as a human? Do cacti live in our local environment? What is a micro-habitat? What is the best material for cleaning up a spillage? Do the tallest people have the biggest feet? Are you faster at running if you are older?</p>	<p>flowering plants, including pollination, seed formation and seed dispersal</p> <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 size of shadows change <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 are attracted to a magnet, and identify some magnetic materials • describe magnets as having 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing 	<p>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 source increases <p>Electricity</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 • recognise some common conductors and insulators, and associate metals with being good conductors
<p>Key Skills: Working scientifically</p> <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 in a simple way to help in answering questions. <p>Plants</p>	<p>Key Skills: Working scientifically</p> <ul style="list-style-type: none"> • asking more complex questions and recognising that they can be answered in different ways • observing closely, using simple equipment and increasing command of vocabulary to describe their observations precisely • identifying and classifying using an increasing command of scientific vocabulary • using their observations and ideas to suggest answers to increasingly complex questions • gathering and recording data with growing accuracy and precisions to answer questions. 	<p>Key Skills: Working scientifically</p> <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 	<p>Key Skills: Working scientifically</p> <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

<p>Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.</p> <p>Animals including humans Pupils might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells.</p> <p>Everyday materials Pupils might work scientifically by: performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'</p> <p>Seasonal changes Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.</p>	<p>Plants Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.</p> <p>Animals including humans Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.</p> <p>Uses of everyday materials Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.</p> <p>Living things and their habitats Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.</p>	<p>questions</p> <ul style="list-style-type: none"> • 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 • 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>Plants Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.</p> <p>Animals including humans Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy, and design meals based on what they find out.</p> <p>Rocks Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils</p>	<p>questions</p> <ul style="list-style-type: none"> • 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 • 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>Living things and their habitats Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.</p> <p>Animals including humans Pupils might work scientifically by: comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.</p> <p>States of Matter Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.</p> <p>Sound Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and</p>
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		<p>are formed.</p> <p>Light Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</p> <p>Forces and Magnets Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.</p>	<p>volume.</p> <p>Electricity Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.</p>
<p>Key Vocabulary Animals Mammal, reptile, amphibian, carnivore, herbivore, omnivore snails and slugs, worms, spiders, and insects Plants Trees, Flowers Parts of plants including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem Body parts including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth The 5 senses Materials- wood, plastic, metal, glass, rock, water The properties of materials hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent Seasons Weather Forecast Temperature</p>	<p>Key Vocabulary Survival Nutrition Health Exercise survival Reproduction/ offspring Life cycle Habitat/ micro-habitat Food chain Environment Materials - as per Y1 plus brick, cardboard, paper and their properties as per Y1, solid, liquid, suitable, unsuitable Property Observe Classify Investigation</p>	<p>Key Vocabulary Animals Mammal, reptile, amphibian, carnivore, herbivore, omnivore snails and slugs, worms, spiders, and insects Plants Trees, Flowers Parts of plants including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem Body parts including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth The 5 senses Materials- wood, plastic, metal, glass, rock, water The properties of materials hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent Seasons Weather Forecast Temperature</p>	<p>Key Vocabulary Survival Nutrition Health Exercise survival Reproduction/ offspring Life cycle Habitat/ micro-habitat Food chain Environment Materials - as per Y1 plus brick, cardboard, paper and their properties as per Y1, solid, liquid, suitable, unsuitable Property Observe Classify Investigation</p>