Pott Shrigley Church School
Science Long Term Plan

The EYFS profile

Understanding the Natural World ELG aims to ensure that children will have the experience to;

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- 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;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Aims of the National Curriculum

The national curriculum for science 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.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting, and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

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The nature, processes, and methods of science

'Working scientifically' specifies the understanding of the nature, processes, and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry, and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing, and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

School curriculum

The programmes of study for science are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage if appropriate. All schools are also required to set out their school curriculum for science on a year-by-year basis and make this information available online.

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The EYFS profile

Understanding the Natural World ELG Children at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- 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;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Teachers are expected to use their professional judgement to make EYFS Profile assessments, using their knowledge and understanding of what a child knows, understands, and can do.

Attainment targets

By the end of each key stage, pupils are expected to know, apply, and understand the matters, skills and processes specified in the relevant programme of study.

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Year 1 Programme of Study

Plants

Pupils should be taught to:

- 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

Animals including humans

Pupils should be taught to:

- 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

Everyday Materials

Pupils should be taught to:

- 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

Seasonal Changes

Pupils should be taught to:

- observe changes across the 4 seasons
- observe and describe weather associated with the seasons and how day length varies

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Year 2 Programme of Study

Living things and their habitats

- Pupils should be taught to:
  - 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 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 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

Plants

Pupils should be taught to:

- observe and describe how seeds and bulbs grow into mature plants
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

Animals, including Humans

Pupils should be taught to:

- notice that animals, including humans, have offspring which grow into adults
- 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

Uses of Everyday Materials

Pupils should be taught to:

- 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 can be changed by squashing, bending, twisting and stretching

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Lower Key Stage 2 Programme of Study

Working Scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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
- 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.

Year 3 Programme of Study

Plants

Pupils should be taught to:

- 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

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Animals, including humans

Pupils should be taught to:

- 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

Rocks

Pupils should be taught to:

- 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

Light

Pupils should be taught to:

- 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

Forces and magnets

Pupils should be taught to:

- 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

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Year 4 Programme of Study

Living things and their habitats
Pupils should be taught to:
- 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

Animals, including humans
Pupils should be taught to:
- 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

States of matter
Pupils should be taught to:
- 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

Sound
Pupils should be taught to:
- 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

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Electricity

Pupils should be taught to:

- 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

Upper Key Stage 2 Programme of Study

Working scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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

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Year 5 Programme of Study

Living things and their habitats

Pupils should be taught to:

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals

Animals, including humans

Pupils should be taught to:

- describe the changes as humans develop to old age

Properties and changes of materials

Pupils should be taught to:

- 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

Pupils should be taught to:

- 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

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Forces

Pupils should be taught to:

- 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

Year 6 Programme of Study

Living things and their habitats

Pupils should be taught to:

- 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
- give reasons for classifying plants and animals based on specific characteristics

Animals, including humans

Pupils should be taught to:

- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- 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

Evolution and inheritance

Pupils should be taught 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
- 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

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Light

Pupils should be taught to:

- 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

Electricity

Pupils should be taught to:

- 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

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Cycle A - EYFS/Y1		
Autumn 1	**Spring 1**	**Summer 1**
Animals including humans – Ourselves	**Everyday Materials – Let's Build**	**Plants – What's Growing in Our Gardens?**
EYFS – Early learning goal • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**EYFS – Early learning goal** • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**EYFS – Early learning goal** • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Key learning objectives • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to our features and the human body. • To understand how we change over time. • To share and discuss baby photos of ourselves. • To identify common features and compare similarities, differences, and changes over time in baby and recent photos of ourselves. • To discuss the questions, 'how do we change over time?' • Name key parts of our bodies. • Collect and record information about our bodies through measuring and observing. • To explore the five senses and learn what job each one does.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to everyday materials. • To understand that objects are made from different materials. • To identify, record, and label the materials that they spot in the classroom. • To learn why we choose to make certain things from specific materials. • To use scientific vocabulary to describe different materials. • To sort and classify objects into groups according to criteria such as hard, soft, stretchy, bendy, and stiff. • To predict which materials could be used to build houses out of a range of materials and investigate which would be the most successful and why.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to flowers and trees. • To discuss what grows in their garden and the garden at our school. • To go in the school grounds to identify, sketch and label plants that we grow. • To explore different types of potatoes and discuss how they are grown. • To understand what a prediction is and make one about growing potatoes. • To think about what we need to grow potatoes. • To plant chitting seed potatoes and make observations over the half term. • To explore the trees in our local area and understand what evergreen and deciduous trees are. • To understand the basic structure of a tree. • To understand the basic structure of a flower.
Curriculum objectives ***EYFS – Understanding the World*** ***The Natural World*** Explore the natural world around them. Describe what they see, hear and feel whilst outside. ***Year 1*** *- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.*	**Curriculum objectives** ***EYFS – Understanding the world*** ***The Natural World*** Explore the natural world around them. ***Year 1*** *- 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*	**Curriculum objectives** ***EYFS – Understanding the World*** ***The Natural World*** Explore the natural world around them. Describe what they see, hear and feel whilst outside. ***Year 1*** *- 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.*

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Autumn 2	Spring 2	Summer 2
Seasonal Changes – Autumn/Winter	**Caring for the Planet**	**Seasonal Changes – Spring/Summer**
EYFS – Early learning goal • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**EYFS – Early learning goal** • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**EYFS – Early learning goal** • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Year 1 - Key learning objectives • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to seasonal change. • To ask the children the enquiry question, 'what do you already know about weather?' • To encourage the children to generate questions that they want to find out about weather. To watch a weather forecast and recognise simple symbols used by the forecasters. • To make observations about weather in the autumn/winter. • To use the simple symbols to record information about the weather after observing it. • To understand how the observed weather is typical or not for the current season. • To understand that the day length changes each day and varies from season to season. • To consider what effect rain has on us and our daily lives. • To make a rain gauge to collect rainwater, make predictions, and record the rain fall over a period of time.	**Year 1 - Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to our planet. • To learn that our planet is made up of land and water. • To learn how our planet has evolved over time. • To explore our local environment by observing the school grounds and immediate locality – Pott Shrigley and Bollington. • To explore natural and manmade features in the local environment. • To discuss how the environment can change and what can cause it to change both locally. • To research how the environment can change and what can cause it to change on a worldwide scale. • To learn what we can do to care for our local environment and how this impacts the wider world. • To explore what people are doing to try and protect our planet. • To research and create a presentation to inform why we should care for our planet.	**Year 1 - Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to seasonal change. • To recap on key vocabulary and symbols relating to weather. • To make observations about the weather and compare similarities and differences between the weather in the other seasons. • To use simple symbols to record information about the weather after observing it. • To observe and discuss that the sun rises in the East and sets in the West. • To understand that certain weather can be specific to different season but that it can change. • To understand that we can measure the weather by using a thermometer. • To use a thermometer to measure the weather and record data over a period of time. • To begin to analyse data and understand how we can make conclusions based on the results.
Curriculum objectives ***EYFS – Understanding the World*** ***The Natural World*** Understand the effect of changing seasons on the natural world around them.	**Curriculum objectives** ***EYFS – Understanding the World*** ***The Natural World*** Recognise some environments that are different from the one in which they live.	**Curriculum objectives** ***EYFS – Understanding the World*** ***The Natural World*** Understand the effect of changing seasons on the natural world around them. ***Year 1*** *- Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.*

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Year 1 *- Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.*	***Year 1 –*** *Asking simple questions and recognising that they can be answered in different ways.* *Observing closely, using simple equipment.* *Using their observations to answer simple questions.*	

Working Scientifically

Year 1 *- 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.

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Cycle B - EYFS/Y1		
Autumn 1	**Spring 1**	**Summer 1**
Everyday Materials - Marvellous Materials	**Animals including humans – Our pets**	**Growing and cooking**
EYFS – Early learning goals • Explore the natural world around them, making observations and drawing pictures of animals and plants.	**EYFS – Early learning goals** • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**EYFS – Early learning goals** • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Key learning objectives • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to everyday materials. • To recap on how different objects are made from different materials. • To explore a range of materials and understand some simple physical properties. • To understand how they can be grouped based on these simple physical properties. • To perform a simple test to explore the suitability of different materials. • To begin to make simple predictions before carrying out an investigation. • To learn how to test materials and understand how we can carry out a fair investigation. • To gather and record data to analyse results to reach a conclusion. • To learn that water is a material and ice is water in a different state. • To observe and record the changes to a block of ice. • To begin to understand what happens to the particles in ice when it starts to melt.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to animals. • To identify a range of animals including fish, amphibians, reptiles, birds, and mammals. • To learn that animals live in habitats and understand that these are different depending on the animal's needs. • To explore the school grounds and learn that this is a habitat for minibeasts. • To make observations in the school grounds using scientific equipment and take photographs of any minibeast that they find. • To explore what kind of conditions the minibeasts in the school grounds need to survive. • To understand some of the key differences between animals. • To discuss why some animals, make good pets and others do not. • To explore what is involved in keeping a pet happy and healthy.	**Key learning objectives** • To use a KWL grid to assess the children's prior knowledge. • To learn and apply key vocabulary relating to growing and cooking. • To recap on prior knowledge about flowers and plants. • To explore what food, we can grow in the UK, thinking about the weather conditions. • To visit RHS Bridgewater to take part in the workshop, 'Fantastic Food', to learn where food comes from. • To visit the kitchen gardens to meet the team who look after it, exploring what food is grown there. • To discuss the local climate and explore how this is different from other countries and what they can grow. • To plant vegetables to grow, plant, and harvest in the school vegetable patch. • To make observations over a period of time of the planted vegetables and record data. • To use locally sourced vegetables to make a summer salad and discuss the environmental and financial impact of growing your own vegetables.

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Curriculum objectives	Curriculum objectives	Curriculum objectives
EYFS – Understanding the world ***The Natural World*** Explore the natural world around them. ***Year 1*** *- 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.*	***EYFS – Understanding the World*** ***The Natural World*** Explore the natural world around them. Describe what they see, hear and feel whilst outside. ***Year 1*** *- 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.*	***EYFS – Understanding the world*** ***The Natural World*** Recognise some environments that are different from the one in which they live. ***Year 1*** *- 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.*

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Autumn 2	Spring 2	Summer 2
What is a Scientist?	**The Natural World**	**Working Scientifically**
EYFS – Early learning goals • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**EYFS – Early learning goals** • 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. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**EYFS – Early learning goals** • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Year 1 - Key learning objectives • To use a KWL grid to assess children's prior knowledge about scientists. • To learn and apply key vocabulary relating to scientists. • To understand what a scientist is and the different strands of science. • To learn about different jobs scientists do including computer scientists, engineers, and the medical profession. • To meet a scientist and generate questions to ask them. • To explore famous scientists including Stephen Hawking, Tim Berners-Lee, and Isambard Kingdom Brunel. • To create a fact file and present it to the class about one of the scientists that have been explored.	**Year 1 - Key learning objectives** • To use a KWL grid to assess the children's prior knowledge. • To learn and apply key vocabulary relating to the natural world. • To learn what natural science is. • To explore the natural world around them and think about what it is. • To make observations about the natural world and understand what living things are. • To learn about different animals and which continents they live in. • To discuss why they might live in those continents. • To draw pictures of plants and animals and make comparisons.	**Year 1 - Key learning objectives** • To use a KWL grid to assess children's prior knowledge about investigations. • To learn and apply key vocabulary relating to working scientifically and carrying out investigations. • To understand that we ask questions in science and carry out investigations to see if we can answer them. • To understand what a prediction is and make simple predictions about a range of tests. • To learn that we need to select simple equipment to help us conduct tests. • To learn how to conduct a fair test. • To understand how to observe a test and record information. • To use their observations to suggest answers to questions and gather and record information.
Curriculum objectives **EYFS –** ***Understanding the World*** ***The Natural World*** Explore the natural world around them. **Year 1 -** *Asking simple questions and recognising that they can be answered in different ways.* *Observing closely.* *Identifying and classifying.* *Using their observations and ideas to suggest answers to questions.* *Gathering and recording data to help in answering questions.*	**Curriculum objectives** **EYFS –** ***Understanding the World*** ***The Natural World*** Explore the natural world around them. **Year 1 -** *Asking simple questions and recognising that they can be answered in different ways.* *Observing closely.* *Identifying and classifying.* *Using their observations and ideas to suggest answers to questions.* *Gathering and recording data to help in answering questions.*	**Curriculum objectives** ***EYFS – Understanding the World*** ***The Natural World*** Explore the natural world around them. ***Year 1 -*** *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.*

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Working Scientifically

Year 1 *- 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.

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Science Long Term Plan

Cycle A - Year 2/3		
Autumn 1	**Spring 1**	**Summer 1**
Animals including Humans – Keeping Healthy	**Everyday Materials – Materials Matter**	**Plants – Ready, steady, Grow!**
Key learning objectives • To assess children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary relating to the human body. • To learn how many bones the human body has. • To name and locate some of the main bones that the human body has. • To learn that a skeleton is needed for protection, movement, and support. • To understand that some animals have skeleton, and some do not. • To know that animals can be classified depending on whether they have a skeleton or not. • To name and locate some muscles in the human body and understand how they work. • To investigate how muscles work in pairs. • To collect data and display it in a bar chart. • To analyse data to answer enquiry questions. • To learn that animals and humans need the right nutrition to support their bodies and they get this from the type of food that they eat.	**Key learning objectives** • To assess children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary relating to materials. • To ask simple questions and recognise that they can be answered in different ways. • To observe closely using simple equipment and perform simple tests. • To identify and classify materials based on their properties. • To gather and record data to answer simple questions. • To understand that some materials are absorbent and reasons why absorbent materials would be used. • To test and compare the suitability of materials. • To explore how the shapes of solid materials can be changed by squashing, bending, twisting, and stretching. • To learn about people who have developed new materials including John Dunlop and Charles Macintosh.	**Key learning objectives** • To assess children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary relating to plants and seeds. • To consider seed development and dispersal to generate questions about plant growth. • To examine dandelion plants and make observations using appropriate scientific equipment. • To make simple predictions about how seeds are dispersed. • To explore different ways that seeds are dispersed and understand how the design of seeds is crucial to the way it is dispersed. • To observe and describe how seeds and bulbs grow into mature plants. • To explore and describe how plants need water, light, and suitable temperature to grow and stay healthy. • To discuss hydroponics and plant beans in a bag to observe and record their growth. • To discuss and compare the differences of the bean grown in the light and the bean grown in the dark. • To make careful observations about the beans and record their growth in a table.
Curriculum objectives *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.*	**Curriculum objectives** *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 can be changed by squashing, bending, twisting, and stretching.*	**Curriculum objectives** *Observe and describe how seeds and bulbs grow into mature plants.* *Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.*

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Autumn 2	Spring 2	Summer 2
Rocks and Fossils	**Plants – Roots and Shoots**	**Living Things and Their Habitats – Habitats**
Key learning objectives • To assess children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary relating to rocks and fossils. • To learn the three types of rocks – igneous, sedimentary, and metamorphic - and understand how these rocks are formed. • To name common rocks and identify their different features and qualities through observations. • To learn what permeable and impermeable rocks are. • To devise a comparative test for rocks and make predictions based on enquiry questions. • To complete a local rock survey and analyse the results. • To understand why particular rocks are used for certain purposes. • To learn the process of fossil formation. • To learn who Mary Anning was and why her work as a pioneering palaeontologist was important. • To investigate, discover, and classify the different components of soil. • To draw conclusion from analysing results.	**Key learning objectives** • To assess the children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary relating to flowers, fruits, and seeds. • To consider and discuss what plants need to survive and to set up an enquiry to test the theories. • To identify and describe the functions of different parts of flowering plants, roots, stem/trunk, leaves, and flowers. • To make careful observations and take accurate measurements of seedlings using standard units. • To record findings using scientific language. • To display findings in graphs and analyse data. • To classify food plants according to the part of the plant that is eaten. • To spot differences in the health of seedlings and begin to think about reasons. • To set up a test to investigate the way in which water is transported in plants. • To use data loggers to measure light levels and temperature over a 24-hour period. • To explain findings using knowledge of the Earth's rotation.	**Key learning objectives** • To assess children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary relating to habitats. • To compare the difference between things that are living, dead, and things that have never been alive. • To understand the key features of things that are living, as opposed to dead. • To categorise specimens according to their features. • To identify that most living things live in habitats to which they are suited. • To describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. • To explore microhabitats and their features in the school grounds, making and recording observations. • To explore that there are a varied number of microhabitats with different features and conditions. • To learn that habitats can be small and local but that they can also be extensive. • To understand that creatures are adapted for their habitats. • To explore food chains and understand that living things need other living things to survive. • To classify living things as carnivores, herbivores, and herbivores.
Curriculum objectives *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.*	**Curriculum objectives** *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.*	**Curriculum objectives** *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 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 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.*

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Working Scientifically

Year 2 *- 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.

Year 3 *- 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.
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.

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Cycle B - Year 2/3		
Autumn 1	**Spring 1**	**Summer 1**
Living Things and their Habitats – Gardens and Allotments	**Animals including humans – Healthy Animals**	**Plants – Flowers, Fruits, and Seeds**
Key learning objectives • To assess children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary relating to habitats. • To identify and name a variety of plants and animals in their habitats, including microhabitats. • To describe how animals obtain their food from plants and other animals. • To identify and name different sources of food. • To observe living things in their habitats, consider why they are there and how they are surviving. • To understand the role that gardens, allotments, and farms play in food chains and the features they have as habitats. • To understand that the sun's energy travels through a food chain and then back into the ground.	**Key learning objectives** • To assess the children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary about healthy animals. • To hypothesis about what is in an egg at various stages of incubation. • To research the development of a chick and understand that it is a baby chicken. • Observe chicks closely, discuss findings, and record observations. • Discuss and research what the chicks need to grow into healthy animals. • To become familiar with animals and their offspring. • To understand that humans are animals and that we produce offspring. • To understand what animals need to survive. • To understand that exercise makes the heart work harder and is an essential part of a healthy lifestyle. • To learn the importance of hygiene. • To discuss and research what is meant by a balanced meal and food types.	**Key learning objectives** • To assess children's prior knowledge by using a KWL grid. • To learn and apply key vocabulary relating to flowers. • To observe a range of different flowers closely using magnifiers. • To record findings from observations using scientific language, drawings, and labelled diagrams. • To recognise and label the male and female parts of a flower. • To recognise that flowers vary in size, colour, and shape, but that all play a crucial role in reproduction. • To make first hand observations of the development of fruit from flowers. • To use evidence to form theories. • To understand the process of how fruits develop from pollinated flowers. • To classify fruits according to similarities and differences. • To understand that the function of a fruit is to produce and disperse seeds. • To know the different ways that seeds can be dispersed. • To investigate wind dispersal by setting up a fair test.
Curriculum objectives *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 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 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.*	**Curriculum objectives** *Notice that animals, including humans, have offspring which grow into adults.* *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.*	**Curriculum objectives** *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.*

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Autumn 2	Spring 2	Summer 2
Light and Shadow	**Forces and Magnets**	**Everyday Materials – Squash, Bend, Twist & Stretch**
Key learning objectives • To use a KWL grid to assess children's prior knowledge. • To learn key vocabulary relating to light and shadow. • To recognise that we need light to see things and that dark is the absence of light. • To learn through investigation that light travels in straight lines. • To learn that white light is colourless daylight and that it contains all the wavelengths of the visible spectrum at equal intensity. • To explore that light reflects is reflected from surfaces through investigation. • To know what a light source is and understand that it can be natural (sun) or artificial. • To recognise that light from the sun can be dangerous and explore ways that we can protect our eyes. • To predict and investigate which colours show up best and least in the dark. • To investigate shining a torch on materials including those that are reflective. • To investigate the nature of reflections in mirrors. • To recognise that shadows are formed when the light from a light source is blocked by an opaque object. • To investigate and observe patterns in the way that the size of a shadow changes. • To use scientific evidence to answer questions and support findings.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn key vocabulary relating to forces and magnets. • To learn about the scientist Isaac Newton and how he discovered gravitational force. • To understand that forces are pushes and pulls which can make things move, stop, or change shape. • To plan and investigate to compare the amount of force needed to move an object on different surfaces. • To make choices about how to make it a fair test and whether to measure push or pull. • To evaluate, review and discuss findings. • To investigate how gravitational and magnetic force can move things at a distance without contact. • To explore magnetism by carrying out a fair test. • To make observations, collate results, and use them to draw conclusions. • To compare and group everyday materials based on whether they are attracted to a magnet. • To report on findings, including oral and written explanations. • To recognise that magnets have two poles and how they can attract and repel.	**Key learning objectives** • To use a KWL grid to assess the children's prior knowledge. • To earn key vocabulary relating to materials. • To explore the properties of a variety of balls. • To generate questions and discuss the similarities and differences between the balls. • To design an investigation to test which ball is the bounciest. • To make predictions and record results. • To learn what makes a material have bouncy properties. • To examine fabrics and discuss the requirements of some clothes. • To discuss how to test the fabric's elasticity, make predictions, carry out a fair test, and analyse the results. • To understand that some materials need to 'give a little' and not break. • To examine a selection of materials and discuss their rigidity. • To devise an investigation to test the flexibility of materials. • To test materials for their durability and toughness and consider the usefulness of materials for our everyday lives. • To understand that paper varies in strength and generate a fair test to investigate the strength of paper. • To use observations to suggest answer to questions.
Curriculum objectives *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.*	**Curriculum objectives** *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.*	**Curriculum objectives** *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 can be changed by squashing, bending, twisting, and stretching.*

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	Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	

Working Scientifically

Year 2 *- 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.

Year 3 *- 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.
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.

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Cycle A - Years 4/5/6		
Autumn 1	**Spring 1**	**Summer 1**
Animals including humans – Teeth (4)	**Forces (5)**	**Animals including Humans – The Art of Being Human (6)**
Key learning objectives • To use a KWL grid to assess prior knowledge of the human body and teeth. • To learn and apply key vocabulary relating to human body and teeth. • To use evidence to answer questions about teeth. • To discuss what we can do to keep our teeth healthy. • To understand why teeth are different shapes and what functions they have. • To compare teeth from herbivores and carnivores and consider why they are different. • To recognise and label basic parts of the digestive system and understand their functions. • To carry out an investigation to demonstrate the human digestive system. • To begin to understand what our digestive system might do if we are well/unwell. • To look at the diets of other animals and compare them to that of a human. • To begin to understand why scientists can use poo to tell them more about an animal. • To research information and explain the different diets of carnivores, omnivores, and herbivores. • To define predator, prey, and producer. • To make links between plants and animals in the form of food chains. • To understand that humans have a responsibility to care about the impact on human food chains.	**Key learning objectives** • To use a KWL grid to assess prior knowledge of forces. • To learn and apply key vocabulary relating to forces. • To learn what gravity and resistance are and identify balanced and unbalanced forces. • To generate enquiry questions based on their observations of the world around them. • To plan an investigation into the effectiveness of various parachutes. • To identify variables that need to change and need to stay constant and create hypothesis based on the variables. • To record data and present findings, including conclusions, causal relationships and explanations of and degree of trust in results, in oral form. • To investigate how levers work; exploring how the position of fulcrum, load and effort impacts on use. • To investigate how pulleys work and how the number of pulleys used changes the effort required. • To draw diagrams that explain the forces, loads, weights and efforts for levers and pulleys. • To understand how gears and gear ratios work. • To identify appropriate gear combinations for specific terrains. • To identify and record gear ratios. • To investigate the effect ground fiction has on movement. • To investigate and identify the effect of boat shape on water. • To present findings and recommendations, based on scientific evidence, in written form.	**Key learning objectives** • To use a KWL grid to assess prior knowledge. • To learn and apply key vocabulary relating to the human body. • To identify and describe components of blood and their respective functions, noting the different blood groups. • To name the three types of blood vessels: arteries, veins, and capillaries. • To explore the structure and function of the human heart. • To investigate and understand that heart size and speed relates to age, fitness, and activity, and can be improved. • To learn that nutrients and water are transported around the body in blood. • To know that diffusion and osmosis are processes that move nutrients and water around the body and to investigate this. • To be able to demonstrate how blood transports nutrients, water, gases, and waste around the body. • To explore and demonstrate how the circulatory system works including the role of the heart. • To identify those aspects of a diet that are healthy and unhealthy and the impact that diet can have on the body, using scientific evidence. • To examine the amount and types of exercise that keep a child and adult body healthy. • To identify how drugs impact the way the human body functions. • To identify that certain drugs can be used for positive effect in the form of medicine. • To understand the negative physical, social, and emotional impact of drug misuse.

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Curriculum objectives	Curriculum objectives	Curriculum objectives
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.*	*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.*	*Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.* *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.*

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Autumn 2	Spring 2	Summer 2
Electricity (4)	**Earth and Space (5)**	**Evolution and Inheritance – The Game of Survival (6)**
Key learning objectives • To use a KWL grid to assess the children's prior knowledge. • To learn key vocabulary relating to electricity. • To identify common appliances that that run on electricity. • To identify that some electrical items are powered from mains electricity, and some are powered from batteries. • To understand the dangers of electricity. • To understand that electrical dangers are often associated with materials that are good conductors. • To generate relevant questions and use different scientific enquiries to answer them. • To predict if different circuit layouts will light a bulb, and then test predications. • To identify electrical materials and components required for a buzzer to sound or a bulb to light. • To construct a series circuit, identifying and naming its parts, including cells, wires, bulbs, switches, and buzzers. • To identify symbols in an electrical circuit. • To open and close a circuit with a switch and predict and test which other materials could be used to conduct electricity. • To record findings and draw conclusions about materials used to make electrical circuits and materials used to keep us safe from electrical circuits. • To use scientific evidence to answer questions and support findings following an investigation. • To demonstrate an understanding of conductors and insulators by answering questions.	**Key learning objectives** • To use a KWL grid to assess the children's prior knowledge. • To learn and apply key vocabulary relating to Earth and Space. • To suggest enquiry questions to back up a series of statements about the Earth, Moon, and Sun. • To match possible scientific approaches to investigating enquiry questions. • To create a scaled solar system model using spherical representations. • To research and collate planetary data online and represent it graphically. • To use ratios for scale and calculate and measure distances using a scaled system. • To understand the difference between geo and heliocentric solar systems and how views have evolved. • To present information and findings. • To carry out a shadow investigation and observe, measure, record, and identify patterns in changing shadows throughout the day. • To track the Earth's movement by making and observing a sundial. • To explore the Earth's movement through simulation and time zones. • To solve problems using scientific evidence. • To carry out a simulation to investigate and demonstrate why the Moon appears as it does in the sky. • To use photographs as a scientific source to identify features on the moon. • To link lunar phases to the position of the Moon, Earth, and Sun in the form of a diagram.	**Key learning objectives** • To use a KWL grid to assess the children's prior knowledge. • To learn and apply key vocabulary relating to evolution and inheritance. • To identify inherited characteristics in living things. • To know that variation occurs within offspring as well as across species. • To research variation and adaptation across specific animals and plants (local and global). • To identify advantages and disadvantages of certain characteristics. • To describe physical regions and their wildlife. • To suggest how some animals and plants are adapted to extreme environments. • To understand the implications of key physical aspects of an environment for living things. • To recognise the role fossils have in the development of evolutionary development. • To learn more about the work of Mary Anning and to learn about Charles Darwin and Alfred Wallace. • To examine how the fossil record helps us to understand evolutionary relationships. • To understand what a cladogram is and how it shows evolutionary relationships. • To research and present information on a specific animal.

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Curriculum objectives	Curriculum objectives	Curriculum objectives
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.	*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.*	*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.*

Working Scientifically

Year 4 - *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.
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.

Years 5 and 6 *- 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 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.

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Cycle B - Year 4/5/6		
Autumn 1	**Spring 1**	**Summer 1**
States of Matter – (4)	**Properties of Materials – (5)**	**Electricity – Electric Celebrations (6)**
Key learning objectives • To use a KWL grid to assess the children's prior knowledge. • To learn and apply vocabulary relating to states of matter. • To understand that materials can be classified into different states and begin to use simple practical enquiries and scientific evidence to support findings. • To develop understanding of gases through simple practical tasks. • To ask and answer questions about the evidence of gas around us. • To use practical enquiries and scientific evidence to demonstrate to others the evidence for gases. • To understand through practical tasks, that materials change state when they are heated or cooled and describe this process using scientific language. • To learn to accurately use a thermometer and use a data logger to record temperature over time and interpret the results. • To understand that liquids have a solidifying point and a boiling point. • To learn the water cycle and to ask and investigate questions about evaporation and condensation. • To set up a fair test to investigate factors that speed up evaporation. • To know that water moves in a cycle due to changes in temperature causing water to change from one state to another. • To demonstrate evidence of condensation and evaporation using a practical test.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to properties of materials. • To compare and group together materials based on their properties. • To plan and carry out an investigation to test for hardness with a range of materials. • To present results from the findings in a scatter graph, identifying the hardest materials that are also fit for purpose as a food prep surface. • To make predictions and carry out an investigation to explore thermal insulating properties. • To record and present findings in a table and line graph, identifying the best materials for keeping liquids hot or cold. • To recommend materials to store hot and cold items based on investigation findings. • To plan and set up an investigation into the strength of various papers. • To research glass and plastic as bottle materials and identify key properties. • To recommend a material for drinks bottles, based on a range of environmental and property based criteria. • To compare absorbency, strength, and durability through a range of investigations. • To plan and set up an investigation looking at the electricity conducting properties of materials. • To record and interpret data in graph form. • To select the best materials for insulating wires from water, and for conducting electricity based on findings of investigation. • To compare electrical and thermal conduction. • To plan and carry out an investigation into the sound proofing properties of various materials.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to electricity. • To plan and carry out a series of electrical circuit investigations to consolidate current electrical knowledge. • To create enquiry questions to explore further areas. • To create success criteria based on a design brief. • To carry out a series of enquiries that explore the effects of voltage on electrical circuit components. • To record and present findings in tables and graphs. • To look at examples of lights and list key features. • To develop ideas and circuits that reflect the design criteria. • To identify from circuit diagrams those that will or won't work. • To draw an accurate circuit diagram. • To research and explain why electrical components behave as they do in terms of resistance. • To use feedback to improve designs. • To investigate, design, and create a dimmer switch. • To identify materials and tools needed to create a prototype. • To create a working electrical prototype and identify possible improvements. • To explain clearly how components work and the effect that different voltages have on components in a circuit. • To outline how their designs meets all the success criteria.
Curriculum objectives	**Curriculum objectives**	**Curriculum objectives**

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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.*	*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.*	*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.*

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Autumn 2	Spring 2	Summer 2
Living things and their habitats – Name That Living Thing (4)	**Animals including humans – Life Explorers (5)**	**Second Look Science – The Science of Sport**
Key learning objectives • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to living things and their habitats. • To understand the characteristics of a living thing and to begin to consider that living things can be grouped in a variety of ways. • To discuss which living things they would expect to find in their local environment. • To ask relevant questions about living things and their habitats. • To carefully observe and record living things in the local area. • To understand why it is useful to classify living things and answer questions about the features of insects, arachnids, and plants found in the local area. • To create a branching database to sort and identify local invertebrates. • To understand why it is important to make accurate observations when describing features of living things. • To use a branching database/dichotomous classification key. • To use observational drawings to make a larger scale drawing of an invertebrate found in the local area. • To create and use a classification key to name a variety of living things in the wider environment.	**Key learning objectives** • To use a KWL grid to assess the children's prior knowledge. • To learn and apply key vocabulary relating to animals and humans. • To complete online research to find out about the gestation periods of a range of animals including humans. • To create a visual comparison of gestation periods including humans and look for patterns. • To explore the key foetal development in humans. • To create a scientific diagram for the key stages of foetal development and an accompanying growth graph. • To describe the process of foetal development within a scientific diagram. • To recognise and explore key milestones in baby and child development. • To explore baby growth through statistics. • To interpret and understand growth charts and plot personal data as a line graph. • To identify and understand the changes in the adolescent body during puberty. • To recognise and identify those changes through puberty that are gender specific. • To create a Venn diagram to show changes in boys and girls during puberty. • To identify physical and mental changes that happen from adulthood to old age. • To identify, order, and explain the six key stages in a human life. • To create a human timeline diagram.	**Key learning objectives** • To use a KWL grid to assess the children's prior knowledge. • To learn and apply key vocabulary relating to the science of sport. • To identify characteristics of grass and create a classification key for given grasses. • To set up an investigation to determine the best methods for turf maintenance. • To identify and compare the properties of sports materials. • To identify the properties of materials used for equipment and prosthetics in Paralympian sport. • To set up a range of investigations into sports Equipment and record findings. • To suggest how friction, air resistance, and gravity can be exploited in sports based on the findings from the investigation. • To understand the role of diet for an athlete and know that muscles need to be warmed up to prevent injury. • To identify the type and amount of exercise needed to keep the body healthy and sports fit. • To identify the influence of inheritance and environmental factors on sports performance. • To identify some inherited personal traits that may impact on sports performance. • To investigate and suggest effective positioning of stadium floodlights for a night time game. • To design and create circuits to ensure floodlights in a stadium a bright enough. • To identify and research alternative sources of energy.
Curriculum objectives *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.*	**Curriculum objectives** *Describe the changes as humans develop to old age.*	**Curriculum objectives** *Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants, and animals.* *Give reasons for classifying plants and animals based on specific characteristics.*

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Working Scientifically

Year 4 - *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.
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.

Years 5 and 6 *- 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 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.

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Cycle C - Year 4/5/6		
Autumn 1	**Spring 1**	**Summer 1**
Sound (4)	**Changes of Materials – Changing Materials (5)**	**Living things and their habitats- Classification Connoisseurs (6)**
Key learning objectives • To use a KWL grid to assess the children's prior knowledge. • To learn and apply key vocabulary relating to sound. • To understand who Alexander Graham Bell is and learn about his scientific work. • To ask and answer scientific questions about sounds that can be heard and begin to consider how sounds are made. • To understand the term, 'noise pollution'. • To understand that there are many sounds and many ways of making sounds. • To understand that sound is made through vibrations from a source. • To research how sound travels and know that sound travels through different mediums, including air, water, and solids. • To recognise that sounds get fainter as the distance from the sound source increases. • To learn that sound is a form of energy and will know that the more energy that is out into creating a sound, the louder the sound that is made. • To explore patterns between the pitch of a sound and features of the object that produced it. • To begin to see a pattern between the pitch of a sound and features of the object that produced it. • To learn about the workings of the human ear and consider some of the ways that we try to reduce the sounds that we hear. • To understand that we hear because sound waves (vibrations) enter our ear. • To consider reasons needed to reduce sounds and reasons for not reducing sounds. • To plan and carry out an investigation that will find out which material will best reduce sound. • To consider the different variables of the test and plan how to ensure the investigation is fair. • To record the results from the investigation and use them to draw a conclusion.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to materials. • To plan and carry out an investigation into soluble materials. • To investigate filtration, evaporation, and sieving methods to separate materials. • To plan and carry out irreversible cooking investigations. • To plan and carry out oxidation investigations to explore the impact of certain ingredients on an end product. • To complete research on new materials and their uses and apply knowledge of materials to create a new substance. • To record and present methods and findings in written form. • To learn about some famous materials inventors.	**Key learning objectives** • To use a KWL grid to assess the children's prior knowledge. • To learn and apply key vocabulary relating to living things and their habitats. • To learn who Linnaeus was and learn about his classification system. • To explore classification systems, understanding that they group according to similarities and differences. • To create classification routes for a range of living things, identifying relatedness. • To use classification keys to group animals, microorganisms, and plants into broad groups and sub groups according to observable features. • To design and test a classification key for birds, identifying potential flaws. • To observe and record features and names of leaves found in our local environment. • To design and test classification keys to classify leaves found in their local environment. • To describe key characteristics of unusual living things from around the world. • To use descriptions of features, and online research, to attempt to classify unusual living things. • To design, describe, and name a new creature that characteristically sits within the Animalia classification.

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Curriculum objectives	Curriculum objectives	Curriculum objectives
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.*	*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.*	*Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants, and animals.* *Give reasons for classifying plants and animals based on specific characteristics.*

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Autumn 2	Spring 2	Summer 2
Living things and their habitats – Help Our Habitats (4)	**Living things and their habitats – The Art of Living (5)**	**Light (6)**
Key learning objectives • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to living things and their habitats. • To walk round around our school and consider how the environment may have changed. • To consider why the changes have happened. • To consider natural changes to the environment such as tides and seasons. • To understand what some living things can do to survive such changes. • To begin to think about climate change and the impact that this is having. • To conduct an experiment that highlights what the 'greenhouse effect' is. • To record temperatures over time on a table and a graph. • To explore what the impact of environmental changes are, both positive and negative. • To explore the impact environmental change (such as deforestation) is having on specific animals. • To understand how we can help minimise climate change. • To plan a positive change for our local environment and answer questions about why they are making the changes. • To explain to others, which living things will benefit from the changes they are making.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to living things and their habitats. • To dissect and label parts of a flower, identifying the male and female gametes. • To research the lifecycle and reproduction of their flowering plants. • To identify and explain the ways that plants can reproduce asexually, both naturally and artificially. • To set up an investigation into artificial asexual reproduction in flowering plants. • To research the life cycle of insects and amphibians noting that they produce sexually. • To observe and sketch insect and amphibian lifecycles for comparison. • To learn about the lifecycle and reproduction of mammals and birds. • To research and sketch mammalian and bird lifecycles for comparison. • To compare the lifecycles of mammals, amphibians, insects, and birds, spotting patterns. • To make observations, record findings, and draw conclusions as natural scientists. • To research and present, in role, information on a significant naturalist.	**Key learning objectives** • To use a KWL grid to assess children's prior knowledge. • To learn and apply key vocabulary relating to light. • To plan and complete a series of light investigations, identifying variables and ensuring fair testing. • To suggest patterns and connections based on observations and measurements. • To draw conclusions and provide answers based on scientific enquiry. • To investigate and demonstrate that light travels in a straight line. • To understand that a light source is needed in order to see. • To make viable suggestions for given angles. • To demonstrate and describe the movement of light off mirrors. • To plan and carry out an investigation into the reflectiveness of given materials. • To record results in graph form and identify patterns. • To explain that a human shadow has the same shape as a person casting it. • To plan and carry out an investigation into shadow size and position of a light source. • To draw a line graph from investigation data and note any patterns. • To investigate magnifying lenses, suggesting which cannot magnify enough in given circumstances. • To explain and demonstrate that light can be bent when it is slowed down. • To split white light into rainbow colours.
Curriculum objectives *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.*	**Curriculum objectives** *Describe the differences in the life cycles of a mammal, an amphibian, an insect, and a bird.* *Describe the life process of reproduction in some plants and animals.*	**Curriculum objectives** *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.*

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