



Forest Federation

Long Term Planning

EYFS, Key Stage 1 & Key Stage 2 Science

EYFS

Understanding the world:

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

Key stage 1 & Key stage 2

Purpose of Study

Science is an integral part of modern society. A working understanding of key scientific concepts coupled with an enthusiasm for the subject is important for every child and something that we are keen to foster within our federation of schools. The main areas for scientific study within our science curriculum will be determined by the updated National curriculum (September 2013).

Aims of the Our Science Curriculum

- To develop pupils' interest in, and enjoyment of all aspects of scientific study.
- To foster a deep intellectual curiosity regarding the scientific world through:
 - a.) Engaging units of work that are experiment led where possible.
 - b.) A knowledge of key scientific figures and concepts.

- c.) An ability to ask scientific questions about concepts that interest them and think about how answers could be obtained.
- d.) A knowledge of important scientists and an appreciation of why their breakthroughs are so important.
- To familiarise children with age-appropriate, high level scientific vocabulary in all scientific disciplines.
- To develop pupils' practical scientific skills through experimentation and an increasing familiarity with concepts such as fair testing, formulating hypotheses, pilot studies and using control groups as they progress up the school.
- To ensure children receive a scientific education in line with the expectations of the National Curriculum. This will cover the breadth of the national curriculum, going into depth where possible, especially where children's interests lie.

Key Stage 1

Pupils in years 1 and 2 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships. They should ask people questions and use simple secondary sources to find answers. They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language.

Working Scientifically Skills

- i. asking simple questions and recognising that they can be answered in different ways
- ii. observing closely, using simple equipment
- iii. performing simple tests
- iv. identifying and classifying
- v. using their observations and ideas to suggest answers to questions
- vi. gathering and recording data to help in answering questions.

EYFS/Key Stage 1 overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year A	Amazing Me	Wild Weather	Brilliant Builders	Growing things	Wild and wonderful creatures	Food Chains
Year B	People and their pets	Weather art	Brilliant Builders	Art and nature	Exploring changes	Habitats and homes

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KEY CONCEPTS GRID

Year A KS1	Autumn 1 Amazing Me!	Spring 1 Brilliant Builders	Summer 1 Wild & Wonderful Creatures
Key Concepts	<p>EYFS Talk about the lives of people around them and their roles in society (name, describe and talk about members of their own family.)</p> <p>Learn about the 5 senses.</p> <p>Understand the effect of the changing seasons on the natural world around them.</p> <p>Year 1 · Be able to name and locate parts of the human body, including those relating to the senses.</p>	<p>EYFS Understand some important processes and changes in the natural world around them, including seasons and <u>changing states of matter</u>.</p> <p>To explore collections of materials with similar and/or different properties.</p> <p>To talk about the differences between materials and changes they notice.</p> <p>Year 1 · Recognise the difference between the name of an object and the material from which it is made.</p>	<p>EYFS Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Year 1 · Be able to name and locate parts of the human body, including those relating to the senses. · Be able to identify and name different common animals including fish amphibians, reptiles, birds and mammals.</p>

	<ul style="list-style-type: none"> · Be able to identify and name different common animals including fish amphibians, reptiles, birds and mammals. · Be able to describe and compare the observable features of animals from a range of groups. · Recognise that animals can be grouped according to whether they are carnivores, herbivores and omnivores. · Know the basic needs of animals for survival. <p>Year 2</p> <ul style="list-style-type: none"> · Know about the basic needs of animals, including humans, for survival. · Describe the importance of exercise, balanced diet and hygiene for humans. · Describe the main changes as young animals, including humans, grow into adults. 	<ul style="list-style-type: none"> · Identify a range of everyday materials including wood, plastic, glass, metal, water and rock. · Describe the physical properties of everyday materials including hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/ not waterproof, absorbent/ not absorbent, opaque/ transparent. · Understand how to group everyday materials according to their physical properties. <p>Year 2</p> <ul style="list-style-type: none"> · Understand how everyday materials can be used for more than one thing. · Understand how different everyday materials can be used for the same thing. · Understand why the properties of materials make them suitable or unsuitable for particular purposes. · Recognise that squashing, bending, twisting and stretching can change the shapes of solid objects made from some everyday materials. 	<ul style="list-style-type: none"> · Be able to describe and compare the observable features of animals from a range of groups. · Recognise that animals can be grouped according to whether they are carnivores, herbivores and omnivores. · Know the basic needs of animals for survival. <p>Year 2</p> <ul style="list-style-type: none"> · Know about the basic needs of animals, including humans, for survival. · Describe the importance of exercise, balanced diet and hygiene for humans. · Describe the main changes as young animals, including humans, grow into adults
	Autumn 2 Wild Weather	Spring 2 Growing Things	Summer 2 Food Chains
Key Concepts	<p>EYFS</p> <p>Understand some important changes in the natural world around them, including the seasons and changing states of matter.</p> <p>Year 1</p> <ul style="list-style-type: none"> · Understand and describe the main changes across the seasons. · Understand weather associated with the seasons. · Understand how day length varies across the year. 	<p>EYFS</p> <p>Recognise and know some similarities and differences of the natural world around them and contrasting environments. (Describe what they see, hear and feel while they are outside.)</p> <p>Explore the natural world around them. Making observations and drawing pictures of animals and plants.</p> <p>Year 1</p> <ul style="list-style-type: none"> · Be able to name a variety of different plants (including deciduous and evergreen trees). 	<p>EYFS</p> <p>Recognise and know some similarities and differences of the natural world around them and contrasting environments.</p> <p>Year 2</p> <ul style="list-style-type: none"> · Recognise whether things are alive, dead or have never lived. · Identify different plants and animals and recognize that they are suited to their different habitats, including micro-habitats.

		<ul style="list-style-type: none"> · Understand and describe how plants are suited to different habitats. · Understand and describe the structure of plants including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches and stem. <p>Year 2</p> <ul style="list-style-type: none"> · Understand and describe the main changes as seeds and bulbs grow into mature plants. · Understand and describe the basic needs of plants for water, light and a suitable temperature to grow and stay healthy. 	<ul style="list-style-type: none"> · Recognise how different habitats provide for the basic needs of animals and plants. · Understand that animals get their food from other animals and/or from plants. · Recognise that a food chain is made of a series of plants and animals that eat each other and shows how energy is transferred from one organism to another via food.
Year B	Autumn 1 People and their pets	Spring 1 Brilliant Builders	Summer 1 Exploring Changes
	<p>EYFS Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Year 1</p> <ul style="list-style-type: none"> · Be able to name and locate parts of the human body, including those relating to the senses. · Be able to identify and name different common animals including fish amphibians, reptiles, birds and mammals. · Be able to describe and compare the observable features of animals from a range of groups. · Recognise that animals can be grouped according to whether they are carnivores, herbivores and omnivores. · Know the basic needs of animals for survival. <p>Year 2</p> <ul style="list-style-type: none"> · Know about the basic needs of animals, including humans, for survival. 	<p>EYFS Understand some important processes and changes in the natural world around them, including seasons and <u>changing states of matter</u>.</p> <p>To explore collections of materials with similar and/or different properties.</p> <p>To talk about the differences between materials and changes they notice.</p> <p>Year 1</p> <ul style="list-style-type: none"> · Recognise the difference between the name of an object and the material from which it is made. · Identify a range of everyday materials including wood, plastic, glass, metal, water and rock. · Describe the physical properties of everyday materials including hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/ not 	<p>EYFS Understand some important processes and changes in the natural world around them, including seasons and <u>changing states of matter</u>.</p> <p>To explore collections of materials with similar and/or different properties.</p> <p>To talk about the differences between materials and changes they notice.</p> <p>Year 1</p> <ul style="list-style-type: none"> · Recognise the difference between the name of an object and the material from which it is made. · Identify a range of everyday materials including wood, plastic, glass, metal, water and rock. · Describe the physical properties of everyday materials including hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/ not

	<ul style="list-style-type: none"> · Describe the importance of exercise, balanced diet and hygiene for humans. · Describe the main changes as young animals, including humans, grow into adults. 	<p>waterproof, absorbent/ not absorbent, opaque/ transparent.</p> <ul style="list-style-type: none"> · Understand how to group everyday materials according to their physical properties. <p>Year 2</p> <ul style="list-style-type: none"> · Understand how everyday materials can be used for more than one thing. · Understand how different everyday materials can be used for the same thing. · Understand why the properties of materials make them suitable or unsuitable for particular purposes. · Recognise that squashing, bending, twisting and stretching can change the shapes of solid objects made from some everyday materials. 	<p>waterproof, absorbent/ not absorbent, opaque/ transparent.</p> <ul style="list-style-type: none"> · Understand how to group everyday materials according to their physical properties. <p>Year 2</p> <ul style="list-style-type: none"> · Understand how everyday materials can be used for more than one thing. · Understand how different everyday materials can be used for the same thing. · Understand why the properties of materials make them suitable or unsuitable for particular purposes. Recognise that squashing, bending, twisting and stretching can change the shapes of solid objects made from some everyday materials.
	Autumn 2 Weather Art	Spring 2 Art and nature	Summer 2 Habitats and homes

	<p>EYFS Understand some important changes in the natural world around them, including the seasons and changing states of matter.</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Year 1</p> <ul style="list-style-type: none"> · Understand and describe the main changes across the seasons. · Understand weather associated with the seasons. · Understand how day length varies across the year. 	<p>EYFS Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Year 1</p> <ul style="list-style-type: none"> · Be able to name a variety of different plants (including deciduous and evergreen trees). · Understand and describe how plants are suited to different habitats. · Understand and describe the structure of plants including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches and stem. <p>Year 2</p> <ul style="list-style-type: none"> · Understand and describe the main changes as seeds and bulbs grow into mature plants. · Understand and describe the basic needs of plants for water, light and a suitable temperature to grow and stay healthy. 	<p>EYFS Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Year 2</p> <ul style="list-style-type: none"> · Recognise whether things are alive, dead or have never lived. · Identify different plants and animals and recognize that they are suited to their different habitats, including micro-habitats. · Recognise how different habitats provide for the basic needs of animals and plants. · Understand that animals get their food from other animals and/or from plants. · Recognise that a food chain is made of a series of plants and animals that eat each other and shows how energy is transferred from one organism to another via food.
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Year 1, Year 2

<p>Year A</p> <p>Expected outcomes for Year A: <u>Autumn 1 – Animals including Humans-Amazing Me!</u> i) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Year B</p> <p>Expected outcomes for Year B: <u>Autumn 1 – Animals including Humans – People and their pets.</u></p>
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- ii) notice that animals, including humans, have offspring which grow into adults.
- iii) find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- iv) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Autumn 2- Seasonal Changes – Wild Weather!

- i) observe changes across the four seasons.
- ii) observe and describe weather associated with the seasons and how day length varies.

Spring 1- Everyday materials- Brilliant Builders! Choosing the best materials.

- i. distinguish between an object and the material from which it is made.
- ii. identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- iii. describe the simple physical properties of a variety of everyday materials.
- iv. compare and group together a variety of everyday materials on the basis of their simple physical properties.
- v. identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- vi. find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Spring 2- Plants- Growing Things

- i. identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- ii. identify and describe the basic structure of a variety of common flowering plants, including trees.
- iii) observe and describe how seeds and bulbs grow into mature plants
- iv) find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

- i) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
- ii) notice that animals, including humans, have offspring which grow into adults.
- iii) find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- iv) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Autumn 2 – Seasonal Changes – Weather Art

- i) observe changes across the four seasons.
- ii) observe and describe weather associated with the seasons and how day length varies.
- iii) observe and name a variety of sources of light, including electric lights, flames and the Sun.
- iv) associate shadows with a light source being blocked by something.

Spring 1- Everyday Materials – Brilliant Builders!

- i) distinguish between an object and the material from which it is made.
- ii) identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- iii) describe the simple physical properties of a variety of everyday materials.
- iv) compare and group together a variety of everyday materials on the basis of their simple physical properties.
- v) identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- vi) find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Spring 2 – Plants – Art and nature

- i) identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- ii) identify and describe the basic structure of a variety of common flowering plants, including trees.
- iii) 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.
- iv) identify and name a variety of plants and animals in their habitats, including microhabitats.

Summer 1- Wild and wonderful creatures -

- i) identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates
- ii) identify and name a variety of common animals that are carnivores, herbivores and omnivores
- iii) describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, and including pets)
- iv) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
- v.) notice that animals, including humans, have offspring which grow into adults.
- vi) find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- vii) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Summer 2- Living Things and Their Habitats- Food Chains

- i) explore and compare the differences between things that are living, dead, and things that have never been alive
- ii) 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
- iii) identify and name a variety of plants and animals in their habitats, including micro-habitats

- v) 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.

Summer 1 – Use of everyday materials – Exploring Changes

- i) distinguish between an object and the material from which it is made.
- ii) identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- iii) describe the simple physical properties of a variety of everyday materials.
- iv) compare and group together a variety of everyday materials on the basis of their simple physical properties.
- v) identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- vi) find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Summer 2 – Habitats – Habitats and homes

- i) explore and compare the differences between things that are living, dead, and things that have never been alive.
- ii) 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.

iv) 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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Key Stage 2

Lower Key stage 2

Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Science – key stages 1 and 2 15 Notes and guidance (non-statutory) They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.

Lower Key Stage 2

Working Scientifically Skills:

- I. asking relevant questions and using different types of scientific enquiries to answer them.
- ii. setting up simple practical enquiries, comparative and fair tests
- iii. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, (using a range of equipment, including thermometers and data loggers)
- iv. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- v. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Vi. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

- vii. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- viii. identifying differences, similarities or changes related to simple scientific ideas and processes
- ix. using straightforward scientific evidence to answer questions or to support their findings

LKS2 Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year A	This planet rocks	Fit for success	A world of living things	A feast of flowers, fruits and seeds	What's the matter?	Shining the light
Year B	Magnetic fun and games	Sounds spectacular	Habitat helpers	Greatly green growers	The circle of life	Electric Personalities

KEY CONCEPTS GRID FOR LKS2

Year 3, Year 4

Year A LKS2	Autumn 1 This planet rocks	Spring 1 A world of living things	Summer 1 What's the matter?
<p>Key Concepts</p>	<p>Year 3</p> <ul style="list-style-type: none"> · Recognise that there are different kinds of rocks with different appearances and physical properties. · Recognise that fossils are the remains of things (animals, plants, and other organisms) that once lived on Earth and became preserved in rocks. · Recognise that soil is a mixture of tiny particles of rocks, organic matter from animals and plants, and air and water. 	<p>Year 4</p> <ul style="list-style-type: none"> · Recognise that living things can be grouped in a variety of ways that helps us to study and identify them. · Recognise that classification keys can be used to help group, identify and name living things. · Recognise that environments can change, often because of human activity, and that this can affect the survival of living things. 	<p>Year 4</p> <ul style="list-style-type: none"> · Recognise the main properties of solids, liquids or gases: <ul style="list-style-type: none"> · Solids are fairly rigid and tend to keep their shape unless a force is applied · Liquids will pour and flow into any shape · Gases spread out to fill a space and will escape from an unsealed container · Recognise that materials change state when they are heated or cooled and that different materials will respond differently depending on the temperature. <ul style="list-style-type: none"> · Recognise that melting, evaporating, condensing and freezing are changes of state. · Recognise that changes of state are crucial to our water cycle: <ul style="list-style-type: none"> · Evaporation of water changes it to a gas (water vapour). Bodies of water on Earth evaporate and put water vapour into the air. Recognise that evaporation requires heat energy and is faster at higher temperatures. · Condensation is the process by which water vapour in the air cools down and changes to drops of liquid. Water vapour in the cold air condenses into drops, which return water to the Earth as rain or snow.
	<p>Autumn 2 Fit for success</p>	<p>Spring 2 A feast of flowers, fruits and seeds</p>	<p>Summer 2 Shining the light</p>

<p>Key Concepts</p>	<p>Year 3</p> <ul style="list-style-type: none"> · Recognise that animals, including humans, cannot survive without eating because food provides them with energy for survival and growth in the form of nutrients. · Recognise that animals need a balanced diet of nutrients and therefore of foods containing those nutrients. · Recognise that some animals have skeletons and muscles and understand that these are used for movement, support and protection. · Recognise that different types of animals may have different types of skeleton or no skeleton at all. <p>Year 4</p> <ul style="list-style-type: none"> · Recognise that humans have a digestive system made up of different parts that play a particular role in the digestive process. · Recognise that the digestive system in humans is adapted to the food they eat. · Recognise that humans have a mix of different types of teeth that are adapted to the food they eat · Recognise that food chains show how living organisms depend on other living organisms for survival. · Recognise that a food chain is made of a series of plants and animals that eat each other and shows how energy is transferred from one organism to another via food. 	<p>Year 3</p> <ul style="list-style-type: none"> · Recognise that the main parts of a flowering plant are the roots, stem, leaves and flowers. · Recognise that these parts are needed for the plant to grow and reproduce and that each has a specific job - roots and stems are needed for nutrition and support, leaves are needed for nutrition, and flowers are needed for reproduction · Recognise that all plants require air, light, water and nutrients (normally from the soil) but that different plants vary in their specific requirements for these resources. · Recognise that plants make their own food, which is a source of energy to grow and reproduce · Recognise that plants transport water from the roots through the stem to all parts of the plant · Recognise that flowers contain the parts needed for the plant to reproduce and that the life cycle includes pollination, seed formation, seed dispersal and germination. 	<p>Year 3</p> <ul style="list-style-type: none"> · Recognise that we need light in order to see things and that dark is the absence of light. · Recognise that when light hits an object, some of it will be reflected from the surface. · Recognise that shadows are formed when light cannot pass through an object and that an opaque object makes good shadows. · Recognise that the size of a shadow can change depending on the position of the light source or on the distance between the light source and the object · Understand that light from the sun is so intense that it can damage our eyes and that we must therefore not look directly at the sun even when wearing dark glasses.
<p>Year B</p>	<p>Autumn 1 Magnetic fun and games</p>	<p>Spring 1 Habitat helpers</p>	<p>Summer 1 The circle of life</p>
<p>Key Concepts</p>	<p>Year 3</p> <ul style="list-style-type: none"> · Understand that forces act in particular directions and can make an object start moving, stop moving, change shape or change direction. · The greater the force, the greater the movement or change in shape. 	<p>Year 4</p> <ul style="list-style-type: none"> · Recognise that living things can be grouped in a variety of ways that helps us to study and identify them. · Recognise that classification keys can be used to help group, identify and name living things. 	<p>Year 3</p> <ul style="list-style-type: none"> · Recognise that animals, including humans, cannot survive without eating because food provides them with energy for survival and growth in the form of nutrients.

	<ul style="list-style-type: none"> · Know that pushes and pulls are examples of forces. · Understand that forces do not always require contact between two objects – for example, magnetic forces can act without direct contact. · Recognise that magnets attract or repel each other, attracting some materials and not others. · Recognise that magnets have two ends (poles) and understand how the poles of two magnets behave towards each other. 	<ul style="list-style-type: none"> · Recognise that environments can change, often because of human activity, and that this can affect the survival of living things. 	<ul style="list-style-type: none"> · Recognise that animals need a balanced diet of nutrients and therefore of foods containing those nutrients. · Recognise that some animals have skeletons and muscles and understand that these are used for movement, support and protection. · Recognise that different types of animals may have different types of skeleton or no skeleton at all. <p>Year 4</p> <ul style="list-style-type: none"> · Recognise that humans have a digestive system made up of different parts that play a particular role in the digestive process. · Recognise that the digestive system in humans is adapted to the food they eat. · Recognise that humans have a mix of different types of teeth that are adapted to the food they eat · Recognise that food chains show how living organisms depend on other living organisms for survival. · Recognise that a food chain is made of a series of plants and animals that eat each other and shows how energy is transferred from one organism to another via food.
	Autumn 2 Sounds Spectacular	Spring 2 Greatly green growers	Summer 2 Electric personalities

<p>Key Concepts</p>	<p>Year 4</p> <ul style="list-style-type: none"> · Recognise that there is an association between sound and vibrations – that sound is made when an object vibrates. · Recognise that vibrations travel through air (or if we're under water, through water) to the ear and that we hear these as sound. · Recognise that pitch and volume describe different characteristics of a sound, and that these are related to the characteristics of the vibrations: the volume of a sound varies with the size of the vibrations (amplitude), the pitch with the number of vibrations per second (frequency). · Recognise that these characteristics depend upon the properties of the object making the sound, such as the material it is made from. · Recognise that sounds get fainter as the distance from the sound source increases. 	<p>Year 3</p> <ul style="list-style-type: none"> · Recognise that the main parts of a flowering plant are the roots, stem, leaves and flowers. · Recognise that these parts are needed for the plant to grow and reproduce and that each has a specific job - roots and stems are needed for nutrition and support, leaves are needed for nutrition, and flowers are needed for reproduction · Recognise that all plants require air, light, water and nutrients (normally from the soil) but that different plants vary in their specific requirements for these resources. · Recognise that plants make their own food, which is a source of energy to grow and reproduce · Recognise that plants transport water from the roots through the stem to all parts of the plant · Recognise that flowers contain the parts needed for the plant to reproduce and that the life cycle includes pollination, seed formation, seed dispersal and germination. 	<p>Year 4</p> <ul style="list-style-type: none"> · Recognise that common appliances run on electricity · Recognise that electricity can flow through the components of an electrical circuit and will only flow if the circuit is closed i.e., has no gaps. · Recognise that the components of a circuit will usually include an energy source such as a battery, something that uses energy such as a bulb or buzzer, connecting wires, and switches to open and close the circuit. All components must be connected into and made part of the circuit. · Recognise that electricity can flow more easily through some materials than others. · Materials that electricity can pass through easily are called conductors and materials that electricity passes through poorly or not at all are called insulators. Recognise that all metals are good conductors and many plastics are insulators
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Year 3, Year 4

<p>Year A LKS2</p> <p>Expected outcomes for year A: <u>Autumn 1 – Rocks and Fossils- This planet rocks!</u> i) compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ii) describe in simple terms how fossils are formed when things that have lived are trapped within rock iii) recognise that soils are made from rocks and organic matter</p>	<p>Year B LKS2</p> <p>Expected outcomes for year B: <u>Autumn 1–Forces and Magnets – Magnetic fun and games</u> i. compare how things move on different surfaces ii. notice that some forces need contact between two objects, but magnetic forces can act at a distance iii. observe how magnets attract or repel each other and attract some materials and not others</p>
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Autumn 2 – Animals including Humans – Fit for success!

- i. 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
- ii. Identify that humans and some other animals have skeletons and muscles for support, protection and movement

Spring 1 – Living things and their habitats – A World of living Things!

- i. recognise that living things can be grouped in a variety of ways
- ii. explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

Spring 2 – Plants – A Feast of Flowers, Fruits and Seeds!

- i. explore the part that flowers play in the life cycle of flowering plants

Summer 1 – States of Matter - What's the Matter?

- i) compare and group materials together, according to whether they are solids, liquids or gases
- ii) 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)
- iii) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Summer 2 - Light- Shining the light!

- i) recognise that they need light in order to see things and that dark is the absence of light
- ii) notice that light is reflected from surfaces
- iii) recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- iv) recognise that shadows are formed when the light from a light source is blocked by an opaque object
- v) find patterns in the way that the size of shadows change

- iv. 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

- v. describe magnets as having two poles

- vi. predict whether two magnets will attract or repel each other, depending on which poles are facing

Autumn 2 – Sound – Sounds Spectacular!

- i.) identify how sounds are made, associating some of them with something vibrating
- ii.) recognise that vibrations from sounds travel through a medium to the ear
- iii.) find patterns between the pitch of a sound and features of the object that produced it
- iv.) find patterns between the volume of a sound and the strength of the vibrations that produced it
- v.) recognise that sounds get fainter as the distance from the sound source increases

Spring 1 – Living things and their habitats – Habitat Helpers!

- i. recognise that environments can change and that this can sometimes pose dangers to living things

Spring 2 – Plants – Greatly Green Growers!

- i) identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

- ii) 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
- iii) investigate the way in which water is transported within plants

Summer 1 – Animals including Humans – The Circle of Life!

- i) describe the simple functions of the basic parts of the digestive system in humans
- ii) identify the different types of teeth in humans and their simple functions
- iii) construct and interpret a variety of food chains, identifying producers, predators and prey

Summer 2 – Electricity – Electric Personalities

- i) identify common appliances that run on electricity
- ii) construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

	<ul style="list-style-type: none">iii) 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 batteryiv) recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuitv) recognise some common conductors and insulators, and associate metals with being good conductors
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Upper Key Stage 2

Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

Working Scientifically Skills:

- i. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- iv. Using test results to make predictions to set up further comparative and fair tests
- v. 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

vi. Identifying scientific evidence that has been used to support or refute ideas or arguments

UKS2 Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year A	Illustrating life cycles	Materials Consultants	Electric art	Welcome to force-land	The human species	Medical Manoeuvres (Revision Block)
Year B	Special effects materials	Space	Theatre lighting technicians	The classification code	Survival of the fittest	Sensational Science (Revision Block)

KEY CONCEPTS GRID FOR UKS2

Year A UKS2	Autumn 1 Illustrating Life Cycles	Spring 1 Electric Art	Summer 1 The Human Species
Key Concepts	<p>Year 5</p> <ul style="list-style-type: none"> Recognise that all animals and plants undergo life cycles involving birth, growth, and reproduction and that these differ between living organisms. Describe the life cycles of some plants and animals. Recognise that there are two types of reproduction, sexual and asexual. <p>Year 6</p> <ul style="list-style-type: none"> Recognise that classification across all living things is based upon observable characteristics, with organisms in the same group sharing a common set of characteristics that are unique to that group. 	<p>Year 6</p> <ul style="list-style-type: none"> Understand how changing the components in a circuit can affect how the components function. For example, adding more batteries in a circuit will increase the brightness of the bulb and the volume of the buzzer; lengthening the wires in a circuit will decrease both. 	<p>Year 6</p> <ul style="list-style-type: none"> Recognise that animals have a circulatory system with many important functions including supplying all parts of the body with oxygen and nutrients needed for energy and growth and removing waste products from these areas. Recognise that the main parts of the human circulatory system are the blood, blood vessels and the heart. Recognise that this is a closed system in which the heart pumps blood round the blood vessels to reach all parts of the body.

	<ul style="list-style-type: none"> · Recognise that classification based on specific characteristics is done for many reasons: <ul style="list-style-type: none"> · To help identify and organise the vast number of different living organisms · To help understand how living organisms are related to each other and how they have changed over time · To help scientists in their conservation efforts. 		<ul style="list-style-type: none"> · Recognise that other animals have different types of circulatory systems, which serve similar functions to the circulatory system in humans. · Recognise that we need a sensible diet and lifestyle, including plenty of exercise, to keep our bodies healthy. · Recognise that some lifestyles, diets and drugs are harmful, in particular because of the effect they have on the heart and circulatory system.
Year A	Autumn 2 Materials Consultants	Spring 2 Welcome to force-land	Summer 2 Medical Manoeuvres
Key Concepts	<p>Year 5</p> <ul style="list-style-type: none"> · Recognise that materials can be grouped on the basis of their properties and that some of these properties cannot be directly seen – for example, conductivity and response to magnets. · Recognise that some materials can change their state, for example from a solid to a liquid or a liquid to a gas. · Recognise that when a material changes its state, this is a reversible change because the material has changed physically but not chemically. · Recognise that some changes of materials are irreversible and that this is because there have been chemical changes to the materials, resulting in the formation of new materials. · Recognise that when a solid dissolves, it forms a solution in which it remains as a solid and has simply mixed with the liquid. · Recognise therefore that dissolving and melting are different processes. 	<p>Year 5</p> <ul style="list-style-type: none"> · Understand that forces act in particular directions and can make an object start moving, stop moving, change shape or change direction. · The greater the force, the greater the movement or change in shape. · Know that pushes and pulls are examples of forces. · Understand that gravity is an attractive force between any two objects. Recognise that the effect of Earth's gravity is to make unsupported objects fall down. · Understand that air resistance, water resistance and friction act to slow a moving object down. For a falling object, gravity is constant and the time it takes for an object to fall to the ground depends on the resistance the object offers to the air not on the object's mass. · Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	<p>REVISION</p>

Year B	Autumn 1 Special Effects Materials	Spring 1 Theatre lighting technicians	Summer 1 Survival of the fittest
Key Concepts	<p>Year 5</p> <ul style="list-style-type: none"> · Recognise that materials can be grouped on the basis of their properties and that some of these properties cannot be directly seen – for example, conductivity and response to magnets. · Recognise that some materials can change their state, for example from a solid to a liquid or a liquid to a gas. · Recognise that when a material changes its state, this is a reversible change because the material has changed physically but not chemically. · Recognise that some changes of materials are irreversible and that this is because there have been chemical changes to the materials, resulting in the formation of new materials. · Recognise that when a solid dissolves, it forms a solution in which it remains as a solid and has simply mixed with the liquid. · Recognise therefore that dissolving and melting are different processes. 	<ul style="list-style-type: none"> · Recognise that light appears to travel in straight lines. · Understand that we see things because our eyes receive light. · Understand that we see most objects because light from a light source travels to the object and then to our eyes, unless it is a light source in which case we see light that travels from it directly to our eyes. · Develop a more advanced understanding about reflection and its uses: <ul style="list-style-type: none"> · that we can use mirrors to see round corners; · that mirrors reflect an image of any object because light bounces off a mirror in exactly the same pattern as it arrives; · that light is reflected by different amounts depending on the roughness and colour of an object (for example, a white object reflects more light than a dark object). · Develop a more advanced understanding about shadows: <ul style="list-style-type: none"> · that shadows have the same shape as the objects that cast them because light travels in a straight line; · that light passes through some material (transparent) and not others (opaque), and how this affects the ability of an object to form shadows; · how the size of a shadow changes when the distance from the light source, or between the light source and the object, changes; · how the length and position of a shadow depends on the position of the Sun in the sky and that this will change depending on the time of the day and the time of the year. · Recognise that when light travels through an object it can bend. This effect, known as 	<p>Year 6</p> <ul style="list-style-type: none"> · Recognise that offspring are of the same kind as their parents but normally vary from them and from each other; · Recognise that individuals in a population show variation that can lead to them being more or less successful in a given environment; · Recognise that over a long timescale this may lead to evolution of a population; · Identify how animals and plants are adapted to suit their environment in different ways; · Recognise that living things have changed over time, generally very slowly over many generations; · Recognise that fossils provide information about the living things that inhabited the Earth millions of years ago as well as a record of how living things have changed over time.

		refraction, can cause objects to appear distorted, for example, a pen at an angle in a glass of water. Refraction also explains why rainbows happen.	
YEAR B	Autumn 2 Space	Spring 2 The Classification Code	Summer 2 Sensational Science
Key Concepts	<p>Year 5</p> <ul style="list-style-type: none"> · Recognise that the Sun is a star at the centre of our Solar System and that the Earth and other planets revolve round it in the same plane. · Recognise that the Earth spins around its axis at the same time as revolving around the Sun, but we do not feel the Earth spinning because everything around us is moving in the same way. · Recognise that the Moon moves round the Earth and that it takes approximately one month to do so. · Recognise that the movement of the Moon explains why the shape of the Moon appears to change over a month. · Recognise that we see the Moon because it reflects light from the Sun. · Recognise that the Earth's rotation on its axis explains day and night and explains the apparent movement of the Sun across the sky during the day (the Earth is moving, not the Sun), which itself affects the length and position of a shadow. · Recognise that the Earth experiences seasons and that the reason for the seasons is the difference in the hours of sunlight and in the position of the Sun in the sky throughout the year. 	<p>Year 6</p> <ul style="list-style-type: none"> · Recognise that classification across all living things is based upon observable characteristics, with organisms in the same group sharing a common set of characteristics that are unique to that group. · Recognise that classification based on specific characteristics is done for many reasons: <ul style="list-style-type: none"> · To help identify and organise the vast number of different living organisms · To help understand how living organisms are related to each other and how they have changed over time · To help scientists in their conservation efforts. 	REVISION

Year 5, Year 6

Year A UKS2	Year B UKS2
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Autumn 1 - Living things and their habitats – Illustrating Lifecycles

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

Autumn 2 – Properties and changes of materials – Materials Consultants

- i. Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal)
- ii. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic

Spring 1 – Electricity – Electric Art

- i. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- ii. 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
- iii. Use recognised symbols when representing a simple circuit in a diagram

Spring 2 – Forces – Welcome to Force-Land

- i Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- ii Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- iii Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect

Summer 1 – Animals including humans – The Human Species

- i. Describe the changes as humans develop to old age
- ii. Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood
- iii. Recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function
- iv. describe the ways in which nutrients and water are transported within animals, including humans

Autumn 1 – Properties and changes of materials – Special Effects Materials

- i. Compare and group together everyday materials on the basis of their properties, including their solubility and response to magnets
- ii. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- iii. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- iv. Demonstrate that dissolving, mixing and changes of state are reversible changes
- v. 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

Autumn 2 – Earth and Space – Space!

- i. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- ii. Describe the movement of the Moon relative to the Earth
- iii. Describe the Sun, Earth and Moon as approximately spherical bodies
- iv. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Spring 1 – Light – Theatre Lighting Technicians

- i. Recognise that light appears to travel in straight lines
- ii. 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
- iii. 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
- iv. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Spring 2 – Living things and their habitats – The classification code

- 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
- ii. Give reasons for classifying plants and animals based on specific characteristics

Summer 1 – Evolution and Inheritance – Survival of the fittest

Summer 2 – Revision Block – Medical Manoeuvres

- 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
- 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
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Describe the changes as humans develop to old age
- 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 body's function
 - Describe the ways in which nutrients and water are transported within animals, including humans
 - 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
 - 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

- i. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- ii. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- iii. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Summer 2 – Revision Block – Sensational Science

- i. Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution
- ii. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- iii. Demonstrate that dissolving, mixing and changes of state are reversible changes
- iv. 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
- v. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- vi. Describe the movement of the Moon relative to the Earth
- vii. Describe the Sun, Earth and Moon as approximately spherical bodies
- viii. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky
- ix. 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
- x. Give reasons for classifying plants and animals based on specific characteristics
- xi. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- xii. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- xiii. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect