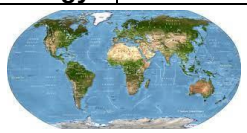
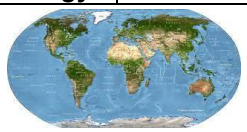
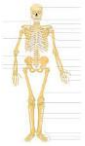
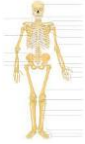
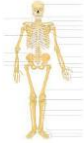
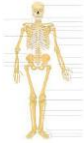
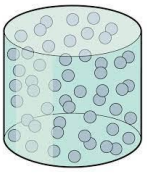
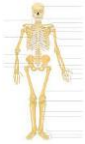
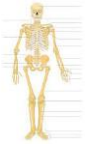
Sandy Hill Academy

aspire academy trust

Science Curriculum

Science Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	People and Communities The World Technology	People and Communities The World Technology	People and Communities The World Technology	People and Communities The World Technology	People and Communities The World Technology	People and Communities The World Technology
						
Reception	People and Communities The World Technology	People and Communities The World Technology	People and Communities The World Technology	People and Communities The World Technology	People and Communities The World Technology	People and Communities The World Technology
						
Year 1	Seasonal Changes Plants 	Seasonal Changes Plants 	Animals Including Humans 	Animals including Humans 	Materials 	Materials 
Year 2	Animals including humans 	Animals including humans 	Living things and their habitats 	Living things and their habitats 	Plants 	Uses of everyday Materials 
Year 3	Rocks 	Animals including humans 	Forces and magnets 	Forces and magnets 	Plants 	Light & Dark 

Year 4	**Electricity** 	**Sound** 	**Living things and their habitats** 	**Living things and their habitats** 	**States of matter** 	**Animals including humans** 
Year 5	**Properties and changes of materials.** 	**Properties and changes of materials.** 	**Forces** 	**Forces** 	**Earth and Space** 	**Living things and their habitats** 
Year 6	**Animals including Humans** 	**Electricity** 	**Evolution and Inheritance** 	**Living things and their habitats** 	**Light** 	**Animals Including Humans** 

Science: Progression of Knowledge and Skills

Progression of Knowledge

Plants

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
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.
Year 2	• 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. • Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
Year 3	• 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.
Year 4	• Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) • Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	• Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
KS3	• Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.

Living Things and their Habitats

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) • Observe changes across the four seasons. (Y1 - Seasonal change)
Year 2	• 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. • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)
Year 3	• Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	• 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. • Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)
Year 5	• 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.
Year 6	• 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.
KS3	• Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. • Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. • Differences between species.

Animals Including Humans

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
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.
Year 2	• 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.
Year 3	• 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.
Year 4	• 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.
Year 5	• Describe the changes as humans develop to old age. • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	• 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. • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
KS3	• Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. • The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. • The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. • The structure and functions of the gas exchange system in humans, including adaptations to function. • The mechanism of breathing to move air in and out of the lungs. • The impact of exercise, asthma and smoking on the human gas exchange system.

Evolution and Inheritance

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	
Year 2	• 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. (Y2 - Living things and their habitats)
Year 3	• Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks)
Year 4	• Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	
Year 6	• 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.
KS3	• Heredity as the process by which genetic information is transmitted from one generation to the next. • A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. • The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. • Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.

Seasonal Change

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.
Year 2	
Year 3	• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)
Year 4	
Year 5	• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)
Year 6	
KS3	• The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.

Materials

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
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.
Year 2	• 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.
Year 3	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)
Year 4	• 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.
Year 5	• 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.
Year 6	
KS3	• Chemical reactions as the rearrangement of atoms. • Representing chemical reactions using formulae and using equations. • Combustion, thermal decomposition, oxidation and displacement reactions. • Defining acids and alkalis in terms of neutralisation reactions. • The pH scale for measuring acidity/alkalinity; and indicators.

Rocks

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	• Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)
Year 2	• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)
Year 3	• 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.
Year 4	
Year 5	
Year 6	• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)
KS3	• The composition of the Earth. • The structure of the Earth. • The rock cycle and the formation of igneous, sedimentary and metamorphic rocks.

Light

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
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. (Y1 - Animals, including humans)
Year 2	
Year 3	• 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.
Year 4	
Year 5	
Year 6	• 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.
KS3	• The similarities and differences between light waves and waves in matter. • Light waves travelling through a vacuum; speed of light. • The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. • Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. • Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. • Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.

Forces

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	
Year 2	• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
Year 3	• Compare how things move on different surfaces. • Notice that some forces need contact between two 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 two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.
Year 4	
Year 5	• 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	
KS3	• Magnetic fields by plotting with compass, representation by field lines. • Earth's magnetism, compass and navigation. • Forces as pushes or pulls, arising from the interaction between two objects. • Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. • Moment as the turning effect of a force. • Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. • Forces measured in Newtons, measurements of stretch or compression as force is changed.

Sound

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
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. (Y1 - Animals, including humans)
Year 2	
Year 3	
Year 4	• 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.
Year 5	
Year 6	
KS3	• Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. • Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. • Sound needs a medium to travel, the speed of sound in air, in water, in solids. • Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. • Auditory range of humans and animals. • Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. • Waves transferring information for conversion to electrical signals by microphone.

Electricity

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	
Year 2	
Year 3	
Year 4	• 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.
Year 5	
Year 6	• 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.
KS3	• Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge. • Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. • Differences in resistance between conducting and insulating components (quantitative). • Static electricity.

Earth and Space

Early learning goal	• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	• Observe changes across the four seasons. (Y1 - Seasonal changes) • Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)
Year 2	
Year 3	
Year 4	
Year 5	• 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.
Year 6	
KS3	• Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). • Our Sun as a star, other stars in our galaxy, other galaxies. • The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. • The light year as a unit of astronomical distance.

Progression of Skills

Asking questions and understanding they can be answered in different ways

Year 1 & 2	Year 3 & 4	Year 5 & 6
Asking simple questions and recognising that they can be answered in different ways • While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. • The children answer questions developed with the teacher often through a scenario. • The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.	Asking relevant questions and using different types of scientific enquiries to answer them • The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. • The children answer questions posed by the teacher. • Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.	*Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary* • Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. • Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.

Making observations and taking measurements

Year 1 & 2	Year 3 & 4	Year 5 & 6
Observing closely, using simple equipment • Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. • They begin to take measurements, initially by comparisons, then using non-standard units.	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • The children make systematic and careful observations. • They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. • During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).

Engaging in practical enquiry to answer questions

Year 1 & 2	Year 3 & 4	Year 5 & 6
Performing simple tests • The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. Identifying and classifying • Children use their observations and testing to compare objects, materials and living	Setting up simple practical enquiries, comparative and fair tests • The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	*Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary* • The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.
things. They sort and group these things, identifying their own criteria for sorting.		

• They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	Explanatory note A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.	

Recording and Presenting Evidence

Year 1 & 2	Year 3 & 4	Year 5 & 6

Gathering and recording data to help in answering questions • The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. • They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. • They classify using simple prepared tables and sorting rings.	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 • The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.

Answering questions and concluding

Year 1 & 2	Year 3 & 4	Year 5 & 6

Using their observations and ideas to suggest answers to questions • Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.	Using straightforward scientific evidence to answer questions or to support their findings. • Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.	Identifying scientific evidence that has been used to support or refute ideas or arguments • Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. • They talk about how their scientific ideas change due to new evidence that they have gathered. • They talk about how new discoveries change scientific understanding.
Using their observations and ideas to suggest answers to questions • The children recognise 'biggest and smallest', 'best and worst' etc. from their data.	Identifying differences, similarities or changes related to simple scientific ideas and processes • Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.	*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* • In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify
	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • They draw conclusions based on their evidence and current subject knowledge.	results that do not fit the overall pattern; and explain their findings using their subject knowledge.

Evaluating findings and raising further questions and predictions

Year 1 & 2	Year 3 & 4	Year 5 & 6
	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.	*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* • They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data.
	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. • Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.	Using test results to make predictions to set up further comparative and fair tests • Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.

Communicating their findings

Science Curriculum Maps

Yea		
	conclusions • They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	*ngs from s, causal of and degree of trust in results, in oral and written forms such as displays and other presentations* • They communicate their findings to an audience using relevant scientific language and illustrations.

EYFS	
Autumn 1	**Autumn 2**
The Body **Lesson 1-** Learn about the body parts- arms, legs & chest **Lesson 2-** Learn about body parts- hands and feet **Lesson 3-** Learn about body parts- eyes and nose **Lesson 4-** Describe ears, mouth and hair **Lesson 5-** Know we have similarities and differences but are all unique **Lesson 6-** Learn about changes in our body since a baby **Materials** **Lesson 1-** Learn about melting **Lesson 2-** Know that things can change shape **Lesson 3-** Explain where your knitted jumper has come from **Lesson 4-** Understand the usefulness of wool and explain what happens to wool when it gets wet **Lesson 5-** Identify materials which act like a mirror **Lesson 6-** Investigate how water changes	**Animals** **Lesson 1-** To learn about living things which are animals **Lesson 2-** Explain where animals live and what they need **Lesson 3-** Know where birds live and what they need **Lesson 4-** Learn about what animals live on the farm **Lesson 5-** Learn all about bears **Senses** **Lesson 1-** Explore ways to make sound **Lesson 2-** Learn about the senses- sight, taste and touch **Lesson 3-** Learn about the senses- smell and touch

EYFS	
Spring 1	**Spring 2**
Space **Lesson 1-** Learn about rockets **Machines** **Lesson 1-** To learn about different types of transport **Lesson 2-** To understand that machines make jobs easier **Lesson 3-** Learn about non-living things **Weather** **Lesson 1-** Learn about rain, ice and water **Lesson 2-** Investigate rainbows in the sky **Lesson 3-** Describe why the air moves **Lesson 4-** Learn about seasonal changes which happen in spring and summer. **Lesson 5-** Learn about seasonal changes which happen in autumn and winter	**Dinosaurs (animal unit of learning)** **Lesson 1-** To learn about dinosaurs which roamed the earth. **Food** **Lesson 1-** To learn about wheat and flour **Lesson 2-** To learn about chicken and eggs **Lesson 3-** To learn about cows and milk **Lesson 4-** To learn about fruit **Lesson 5-** To learn about vegetables **Lesson 6-** Learn about diet and how to stay healthy **Forces** **Lesson 1-** To explain what happens when you push or pull something **Lesson 2-** Investigate objects which float and sink

EYFS	
Summer 1	**Summer 2**
Plants **Lesson 1-** Learn about living things which are plants **Lesson 2-** Learn about plants and where they come from **Lesson 3-** Learn about how to look after plants **Insects** **Lesson 1-** Learn about where insects and invertebrates live **Lesson 2-** Learn about insects and invertebrates **Lesson 3-** Describe characteristics of insects and invertebrates	**The Beach** **Lesson 1-** Explore how waves wear away the coastline **Lesson 2-** Investigate how to make the perfect sandcastle **Lesson 3-** Measuring footprints in the sand **Health & Safety** **Lesson 1-** Know how to stay safe when using electricity **Lesson 2-** Learn about your home and things you need

Year 1 Science Progression

Autumn 1

Introduction to Plants

- 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

Seasonal Changes

- Observe changes across the four seasons
- Observe and describe weather associated with the seasons and how day length varies

Linked Texts, Reading	**Key Scientists**	
A little guide to wild flowers, The magic and mystery of Trees One Year with Kipper (Mick Inkpen), After the Storm (Nick Butterworth)		Elizabeth Warren (local Botanist), Beatrix Potter (Author and Botanist), Joseph Banks Holly Green (Meterologist) , Steve Lyons (Extreme) Weather

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

OTOCE	To observe changes across seasons	What will our school grounds look like at Christmas?
R	To identify the four seasons (Art)	Create collaborative piece of art to reflect the four seasons
R	To know the basic parts of a plant	Natural materials art collage, music **Joseph Banks**
OT	To understand the basic structure of a plant	What will happen to my seed?
IC	To understand the basic structure of a plant (including trees)	How many different types of leaves are there?
PSOCE	To understand that trees change through the seasons	Do trees with bigger leaves lose their leaves first in Autumn?
OTGRD	To understand that the length of the day changes throughout the year	How does the length of the day change throughout the year?

Year 1 Science Progression

Autumn 2

Introduction to Plants

- 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

Seasonal Changes

- Observe changes across the four seasons
- Observe and describe weather associated with the seasons and how day length varies

Linked Texts, Reading	Farming linked text, weather reports	**Key Scientists**	ITV weather team Local farmer

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

OCE	To recognise different types of weather	Making observations, predictions, equipment (thermometer)
OTGRD	To observe and record daily weather	Does the wind always blow in the same direction? Gather data to create a simple chart
R	To understand different foods grown by farmers?	Why are farmers so important?
GRD	To gather, record and represent weather data in a simple graph	Create a pictogram using weather data gathered and use to answer the big question- Does the wind always blow in the same direction?
R	To explain how animals adapt to cold weather	How do animals survive in cold places?
GRDOT	To explain how the length of day changes throughout the year	To interpret data gathered from 'Steve's staycation' to answer the question 'How does the length of a day change over the year?'
OT	To explain how the school grounds have changed throughout the year	What will our school grounds look like at Christmas?

Year 1 Science Progression

Spring 1

Animals Including Humans

- Identify and name a variety of common animals including fish, amphibians, reptiles, mammals & birds
- 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 (birds, fish, amphibians and reptiles 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

Linked Texts, Reading	Super worm (Julia Donaldson), Snail Trail (Ruth Brown)	**Key Scientists**	Chris Packham Sir David Attenborough

Teaching Sequence:

Observations over time, **Comparative/fair test**, **Identifying and classifying**, **pattern seeking**, **observing closely using equipment**, **Gathering and recording data**, **Research (knowledge)** **Ideas over time**

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

IC	To name and label a diagram of the human body	Label body parts on a diagram.
IC	To make close observations of facial features	Making close observations using mirror to name parts of the face
R	To name parts of the human face	Assessment task. To create videos describing differences in the human body (face) Oracy link/ ICT link
PS	To explain the effect that differences in body parts can have	Can children with bigger feet jump further (standing jump) than children with smaller feet? (Prediction focus)
PS	To explain the effect that differences in body parts can have	Investigation: Measuring (ruler/meter rule), observing
PSGRD	To explain the effect that differences in body parts can have carrying out activities	Investigation: Recording data and formulating conclusions. Asking further questions
Asking questions Making close observations	To explain the body part associated with each sense	Practical activity to assess prior learning and identify associated body part for each sense.

Year 1 Science Progression

Spring 2

Animals Including Humans

- Identify and name a variety of common animals including fish, amphibians, reptiles, mammals & birds
- 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 (birds, fish, amphibians and reptiles 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

Linked Texts, Reading	Superworm (Julia Donaldson) Snail Trail (Ruth Brown)	**Key Scientists**	Sir David Attenborough Chris Packham

Teaching Sequence:

Observations over time, **Comparative/fair test**, **Identifying and classifying**, **pattern seeking**, **observing closely using equipment**, **Gathering and recording data**, **Research (knowledge)** **Ideas over time**

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

IC	To identify different things which can be observed using each of our senses.	Making observations in the school grounds using the senses.
IC	To name and label a model of the human body including the associated senses.	Assessment task: To create a model and label with main body parts and senses linked to those body parts.
Close observations	To explore the effectiveness of our senses	Practical senses investigations to consolidate learning
ICGRD Asking relevant questions	To identify and name a variety of common animals	Year 1 visit to Penrice Farm: Identify and sort animals according to different criteria including investigating what they eat. (Introduce carnivore, herbivore and omnivore)
IC	To identify and name a variety of common animals	To name and sort animals into groups- identifying common features.
RIC	To identify animals as carnivores, herbivores and omnivores.	To identify and classify animals as carnivores, herbivores and omnivores. Link to research and data gathered during farm visit.
PSGRD	To identify food that pet animals eat	Do our pets all eat the same types of food? Investigation- home learning link .

Year 1 Science Progression

Summer 1

Materials

- 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

Linked Texts, Reading	The Great Paper Caper (Oliver Jeffers), Who Sank the Boat (Pamela Allen), The Story of Cinderella (Walt Disney)	**Key Scientists**	William Addis (Toothbrush Inventor), Charles Mackintosh (Waterproof coat), John MacAdam (roads)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

OC	To describe the properties of different materials using our senses	Feeling bag- making close observations
OC ICGRD	To identify and name a variety of everyday materials	Materials Hunt – recording data
Close observations	To describe the suitability of different materials	Which material is best? Problem solving and Reasoning
OC Asking relevant questions	To distinguish between an object and the material it is made of	Identifying the material of a range of everyday objects
IC	Compare and group materials	Identifying and classifying everyday objects according to the material they are made of
CT GRD	To plan and carry out up a simple test to compare the strength of different materials	Compare bridges made out of straws, paper and cardboard Gather data
PSGRD	To record and evaluate data gathered in a simple test to compare the strength of different materials	Record data in bar chart Evaluate data and ask further questions

Year 1 Science Progression			
Summer 2			
Materials (working scientifically) Seasons (Observing over time) Plants (Observing over time)			
Linked Texts, Reading		**Key Scientists**	
Teaching Sequence: **Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely, Gathering and recording data, Research (knowledge) Ideas over time** **Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching**			
CT	To plan a simple investigation to compare the suitability of materials for an umbrella	Plan simple test to compare different materials for an umbrella	
CT	To carry out an investigation to compare the suitability of materials for an umbrella	Carry out umbrella investigation and gather data	
GRD	To evaluate data to compare the suitability of materials for an umbrella	Record data and use information for suggesting suitable materials for an umbrella Ask further questions	
OC OT	To make close observations of the school grounds over the year	To make close observations over the summer months and evaluate changes throughout the year	
IC	To name a variety of common flowering plants	To name common plants and identify in the local area (home learning link)	
IC	To name a variety of common trees	To name common trees and identify in the local area (home learning link)	

Year 2 Science Progression

Autumn 1
Animals including Humans

- 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 food and hygiene.

Linked Texts, Reading	The Gruffalo *(Julia Donaldson)*, Meerkat Mail *(Emily Gravett)*, Tadpole's Promise *(Jeanne Willis and Tony Ross)*	**Key Scientists/STEM/Cultural capital**	Calum Jarvis visit (Olympic swimmer) Lands End to John O Groats virtual race, Steve Irwin (Crocodile Hunter), Robert Winston (Human Scientist), Joe Wicks (Personal Trainer)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

RIC	To identify the basic needs of humans to include air, water, food and shelter	Identify and classify things which we need to survive and things which make us happy.
RIC	To identity different food groups	Eatwell Plate
RICGRD	To explore favourite food types	*What is the favourite food type of Maple Class?* Tally Chart
Asking relevant questions	To ask relevant questions to help design a healthy meal	Listen and ask relevant questions to an athlete to design a healthy meal
ICGRD	To identify different food types eaten over a week to help make healthy choices in the future	Home learning: Food diary
R Asking relevant questions	To describe how humans can meet the basic needs of different animals	Animal care fact-file

Year 2 Science Progression

Autumn 2

Animals including Humans

- 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 food and hygiene.

Linked Texts, Reading	The Gruffalo *(Julia Donaldson)*, Meerkat Mail *(Emily Gravett)*, Tadpole's Promise *(Jeanne Willis and Tony Ross)*	**Key Scientists/STEM/Cultural capital**	Calum Jarvis visit (Olympic swimmer) Lands End to John O Groats virtual race, Steve Irwin (Crocodile Hunter), Robert Winston (Human Scientist), Joe Wicks (Personal Trainer)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

GRD Making close observations	To describe the importance of exercise for humans and explore the impact of exercise on the body	What happens to our body when we exercise? Investigation. Gathering data. Making close observations.
RIC Making close observations	To explain how animals, including humans, change as they grow	Animals and their babies
R	To describe the lifecycle of a butterfly	Describe the lifecycle of a butterfly through drama
R	To describe the lifecycle of a frog	Create a diagram to describe the lifecycle of a frog
RIC	To describe the different life stages of a humans	Describe differences in humans according to different life stages.
GRDPS Asking relevant questions. Measuring	To investigate differences in humans according to various life stages	*Will the youngest child in class have the smallest feet?* Compare age and size of feet to explore any patterns

Year 2 Science Progression

Spring 1

Living things & their habitats

- 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 animals and plants and how they depend on each other
- Identify and name a variety of plants and animals in their habitats including micro-habitats
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

Linked Texts Reading	The Gruffalo (Julia Donaldson), Meerkat Mail (Emily Gravett), No Place Like Home (Jonathon Emmett)	**Key Scientists / Cultural Capital**	RSPB Great school Bird watch, Microscope work (Royal microscope society), School Trip to Newquay Zoo, Terry Nutkins (TV Presenter), Liz Bonnin (Conservationist)

Teaching Sequence:

Observations over time, **Comparative/fair test**, **Identifying and classifying**, **pattern seeking**, **observing closely using equipment**, **Gathering and recording data**, **Research (knowledge)** **Ideas over time**

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

OCEGRD IC	To make observations of animals and their habitats in the school grounds	Assess prior knowledge of animals and their habitats. Explore school grounds identifying animals in their habitats.
OCE IC	To explore and compare things which are living, dead and things that have never been alive	Identify and classify things to group as being living, dead and things that have never been alive.
OCE IC Microscopes	To make close observations to help explain how we can know when something is dead	Describe the key life processes. Examine a variety of things under the microscope and explain how we can be certain if something is dead
ICGRDPS	To identify and classify different birds found in the local area	RSPB Great school Bird Watch Observe
R IC Making close observations	To identify a variety of animals and plants in their different habitats	Making close observations to suggest animals found in different habitats
IC Asking relevant questions	To explain why an animal is suited to its habitat	To explain how a habitat meets the basic needs of an animal. Design an animal suited to a particular habitat

Year 2 Science Progression

Spring 2

Living things & their habitats

- 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 animals and plants and how they depend on each other
- Identify and name a variety of plants and animals in their habitats including micro-habitats

Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

Linked Texts Reading	The Gruffalo (Julia Donaldson), Meerkat Mail (Emily Gravett), No Place Like Home (Jonathon Emmett)	**Key Scientists / Cultural Capital**	RSPB Great school Bird watch, Microscope work (Royal microscope society), School Trip to Newquay Zoo, Terry Nutkins (TV Presenter), Liz Bonnin (Conservationist)

Teaching Sequence:

Observations over time, **Comparative/fair test**, **Identifying and classifying**, **pattern seeking**, **observing closely using equipment**, **Gathering and recording data**, **Research (knowledge)** **Ideas over time**

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

GRD Making close observations	To identify microhabitats in the local area	To explore the school to identify different microhabitats and plants/animals found in them
GRDPSIC	To explore contrasting microhabitats	Create a tally of insects found in 2 contrasting microhabitats Record data in a pictogram
CF GRD Making close observations	To explore the suitability of a microhabitat for an animal	Choice chamber investigation
PSIC Asking relevant questions	To identify and name different sources of food	Newquay Zoo visit investigation. Asking relevant to explore different food sources of the animals. Explore patterns between foods and types of animals.
R	To describe how animals obtain their food from plants and other animals, using the idea of a simple food chain	Construct a variety of food chains for different habitats

Year 2 Science Progression

Summer 1

Plants

- 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

Linked Texts Reading	The Tin Forest (Helen Ward), Jack and the Beanstalk (Richard Walker), Ten Seeds (Ruth Brown), A Seed Is Sleepy (Dianna Aston)	**Key Scientists / Cultural Capital**	Agnes Arber (Botanist), Alan Titchmarsh (Botanist & Gardener)

Teaching Sequence:

Observations over time, **Comparative/fair test**, **Identifying and classifying**, **pattern seeking**, **observing closely using equipment**, **Gathering and recording data**, **Research (knowledge)** **Ideas over time**

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

OC Scientific drawings	To identify the basic structure of a variety of common flowering plants including trees	Revisit Year 1 prior learning.
OC IC Scientific drawings	To describe the difference between seeds and bulbs	Sort seeds and bulbs Sketch of a seed and bulb
	To describe how plants need water, light and a suitable temperature to grow	Explanation writing of how we meet the needs of a plant
CT, OC	To set up a simple investigation to explore the best conditions needed to grow a healthy plant	Do bulbs or seeds grow quicker? Making predictions
OC GRD	To make observations and take measurements to find out the best conditions needed to grow a healthy plant.	Gathering and recording data. Weekly measurements Close observations
GRD	To evaluate and draw conclusions from data collected through an investigation exploring suitable conditions for growing a healthy plant	Draw conclusions and write up findings. Diagrams, writing, drawings.

Year 2 Science Progression

Summer 2

Materials

 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

Linked Texts Reading	The Tin Forest *(Helen Ward)* Traction Man *(Mini Grey)* Three Little Pigs *(Lesley Sims)*	**Key Scientists / Cultural Capital**	William Addis (Toothbrush Inventor), Charles Mackintosh (Waterproof coat), John MacAdam (roads)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

IC Making close observations	To recall prior knowledge about materials	Describe objects in the feely bag using suitable adjectives. Identify material used to make the objects
IC GRD Making close observations	To identify and describe the suitability of a variety of everyday materials including wood, metal, glass, brick, rock, paper and cardboard	Materials Hunt Record data in a table
IC OCE Making close observations	To understand how light travels differently through opaque, transparent and translucent materials	What's inside the dragon cave? Children to identify and classify materials as opaque, transparent or translucent using a torch.
CFT	To plan and carry out a comparative test to investigate the most suitable material for blackout curtains	Ogden Trust enquiry 'Make it Dark'
GRD	To record data in a pictogram and draw conclusions about the most suitable material for blackout blinds.	Ogden Trust 'Make it dark' To record data gathered in a table and pictogram. Draw conclusions from the investigation

IC	To make observations and investigate on how the shape of solid objects can be changed by squashing, bending, twisting and stretching	Identify and classify objects according to whether they can change shape through bending, twisting, stretching and squashing

Year 3 Science Progression

Autumn 1

Rocks

- ***Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties***
- ***Describe in simple terms how fossils are formed when things that have lived are trapped within rock***
- ***Recognise that soils are made from rocks and organic matter***

Linked Texts Reading	Pebble in my pocket, Street beneath my feet	**Key Scientists / Cultural Capital**	• Mary Anning, Charles Lyell (geologist) • Mary Anning (palaeontologist), Inge Lehmann (Earth's Mantle) • Local mining (IMERYS, GEEVOR) • School trip- Clay museum (link to Egypt 'Clay pyramids)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

IC	To compare and group different kinds of rocks on the basis of their appearance and simple physical characteristics	Identify and classify rocks in the school grounds
R Making close observations	Recognise the differences between igneous, sedimentary and metamorphic rock (Chocolate rocks)	Making close observations when recreating rock types using chocolate.
IC OCE	To identify common rocks	Identifying rock types. Observing similarities and differences using magnifying glasses.
CF GRD	To identify characteristics of different rocks	Are all rocks strong, durable and waterproof?

OCE	To recognise that soil is made from rocks and organic matter	Making close observations of different soils using magnifying glasses.
R IOT	To describe how fossils are formed when things that have lived are trapped within rock.	Investigation: Recording data and formulating conclusions.

Year 3 Science Progression

Autumn 2

Animals including Humans

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.***

Linked Texts Reading	Illumanatomy (layers of the human body), Giant (Kate Scott), The Story of Frog Belly Rat Bone *(Timothy Basil Ering),* Funnybones *(Janet and Allan Ahlberg),* I Will Never Not Ever Eat a Tomato *(Lauren Child),* Goldilocks and the Three Bears *(Samantha Berger)*	**Key Scientists / Cultural Capital**	Sports nutritionist, Sport physio, doctors. Mary Maynard Daly ,Adelle Davis (20th Century Nutritionist) Marie Curie (Radiation / X-Rays)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

IOT R	To understand the importance of nutrition for animals	Research different types of nutrients *How did the chemist, Mary Maynard Daly use science to help us improve our diets?*
IC	To identify the nutrients in different meals	*How can we group the food we eat?*
R PS	To compare the amount of fat and sugar in different foods	*Research fat and sugar content in different foods and look for patterns*
IC	To explain that animals need skeletons for support and protection	*How do the skeletons of different animals compare?*
R	To explain that animals have muscles for movement	*How do muscles help us to move?* Practical

Making close observations		activity to create a model to replicate how different muscles work together.
CF	To compare the strength of muscles in humans	*Do your muscles get more tired the older you get?*
GRD	To compare the strength of muscles in humans	Interpreting data gathered during investigation. Drawing conclusions and asking further questions.

Year 3 Science Progression

Spring 1

Forces & Magnets

- Compare how things move on different surfaces
- Notice that some forces need contact between two 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 two poles
- Predict whether two magnets will attract or repel each other, depending on which poles are facing

Linked Texts Reading	Magnets and friction, The Iron Man *(Ted Hughes),* Mrs Armitage: Queen of the Road *(Quentin Blake)* Mr Archimedes' Bath *(Pamela Allen)*	**Key Scientists / Cultural Capital**	Leonardo Da Vinci Car investigations, William Gilbert, Andre Marie Ampere (Founder of Electro-Magnetism)

Teaching Sequence:

Observations over time, **Comparative/fair test**, **Identifying and classifying**, **pattern seeking**, **observing closely using equipment**, **Gathering and recording data**, **Research (knowledge)** **Ideas over time**

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

Making close observations	To explain how materials can move and change shape	Assessment activity. Revisit prior learning.
To ask relevant questions	To ask questions and suggest ideas about forces and magnets based on my prior knowledge	Revisit prior learning linked to forces and magnets. To ask relevant questions to move learning forward.
ICGRD	To identify a force as a push or a pull	To identify movements as a push or a pull and record data in a Venn diagram
CFGRD	To compare how things move on different surfaces	*Which surface do cars travel the furthest on?* Gather and record data. Present in a bar chart.

CFGRD Making predictions	To compare how things move on different surfaces	*How does a surface affect how long a spinning top will spin for?* Prediction focus based on findings from car investigation.
IOT R	To make observations of how magnets attract and repel each other	Practical activity to observe the behaviours of magnets. Ask further questions to investigate.

Year 3 Science Progression

Spring 2

Forces & Magnets

- Compare how things move on different surfaces
- Notice that some forces need contact between two 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 two poles
- Predict whether two magnets will attract or repel each other, depending on which poles are facing

Linked Texts Reading	Magnets and friction, The Iron Man *(Ted Hughes)*, Mrs Armitage: Queen of the Road *(Quentin Blake)*Mr Archimedes' Bath *(Pamela Allen)*	**Key Scientists / Cultural Capital**	Leonardo Da Vinci Car investigations, William Gilbert, Andre Marie Ampere (Founder of Electro-Magnetism)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

IOT R	To explain magnetism	Research work of William Gilbert. Explain Magnetism
R Making close observations	To describe a magnet as having two poles	Oracy: explain the effect of magnetic poles. Draw labelled diagram to support explanations
R PS	To explore the effect that friction has on moving objects	Science Week: To carry out a variety of investigations to consolidate learning linked to friction and to ask further questions
CF	To explore the effective that friction has on different surfaces	Ogden Trust Enquiry: Slippy Shoes

ICGRD Making close observations	To 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	Sort and group objects. Record in a venn diagram
CF	To test the strength of different magnets	Comparative test – strength of magnets Prediction focus Record data in a table

Year 3 Science Progression

Summer 1

Plants

- 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)
- 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

Linked Texts Reading	The Hidden Forest *(Jeannie Baker)* George and Flora's Secret Garden *(Jo Elworthy)*	**Key Scientists / Cultural Capital**	Jan Ingenhousz (Photosynthesis), Joseph Banks (Botanist)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

Making close observations	To describe the functions of different parts of the flowering plants (roots, stem/trunk, leaves and flowers)	Making close observations of parts of a plant. Art: Create plant collage using natural materials
CFGRD Making close observations	To explore the requirements of plants for growth and life	Compare the growth of plants with different conditions
R	To explain how plants can adapt to their habitat	Research different plants in relation to how they have adapted to their environment: cacti, snowdrops, pond lillies
OT	To investigate the way in which water is transported in plants	Celery investigation

R Scientific drawings	To explain the part flowers play in the life-cycle of flowering plants	Children to research and draw diagram to represent the life-cycle of a flowering plant
R	To describe different ways plants disperse their seeds	Children to research write an explanation of how plants disperse their seeds

Year 3 Science Progression

Summer 2

Light and Shadows

- To recognise we need light in order to see things and that dark is the absence of light
- Notice that light is reflected from surfaces
- Recognise that light from the sun can be dangerous and that there are ways to protect our eyes
- Recognise that shadows are formed when the light from a light source is blocked by an opaque object
- Find patterns in the way that the size of shadows change

Linked Texts Reading	Magnets and friction The Owl Who Was Afraid of the Dark *(Jill Tomlinson),* The Dark *(Lemony Snicket),* The Firework-Maker's Daughter *(Philip Pullman)*	**Key Scientists / Cultural Capital**	Leonardo Da Vinci Car investigations, William Gilbert James Clerk Maxwell (Visible and Invisible Waves of Light)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

Asking questions	To recognise that light is needed in order to see things and that dark is the absence of light	Revisit prior learning
PS Making close observations	To recognise that light is needed in order to see things and that dark is the absence of light and notice that light is reflected from surfaces.	Can we see more when there is more light? Making close observations when controlling the amount of light entering a dark box. Pattern seeking.
Making close Observations Asking questions	To recognise that shadows are formed when the light from a light source is blocked by an opaque object	Children to explore making shadows and observing changes, differences

CFGRD	To find patterns in the way that the size of shadows change	Ogden Trust Enquiry 'Shadows'
CF	To recognise that light from the sun can be dangerous and to know how to protect your eyes from the sun	Comparing different SPF suncreams using UV beads
CFGRD	To investigate how light is reflected from different surfaces	Ogden Trust enquiry'Reflective surfaces': Gather and record data in Lux.

Year 4 Science Progression

Autumn 1

Electricity

- Identify common appliances that run on electricity
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators and associate metals with being good conductor
- Safety when using electricity (taught throughout the unit)

Linked Texts, Reading	Until I Met Dudley *(Roger McGough)* Oscar and the Bird: A Book about Electricity *(Geoff Waring)* Electrical Wizard: How Nikola Tesla Lit Up the World *(Elizabeth Rusch*	**Key Scientists/STEM/Cultural capital**	Thomas Edison (First working lightbulb), Joseph Swan (Incandescent lightbulb) Electrician, electrical engineer career

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

IC GRD	To identify common appliances that run on electricity	Sort and group electrical appliances and present data in a Venn Diagram
OT OCE IT	To construct a simple circuit to explain how a light bulb works	How long does a battery light a torch for? Who invented the light-bulb: Thomas Edison or Joseph Swan?
R OCE	To explain the purpose of a switch in a circuit	Can you make a switch using a paperclip?
CFT EW	To explore and recognise electrical conductors and insulators	What materials conduct electricity? How does the thickness of a conducting material affect how bright a lamp is?
OCE	To construct a simple series electrical circuit using a battery, wire, switch and buzzer.	Construct circuit to include a buzzer (assessment activity)

Year 4			
Autumn 2			
Sound • Identify how sounds are made, associating some of them with something vibrating • Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the pitch of a sound and features of the object that produced it • Recognise that sounds get fainter as the distance from the sound source increases			
Linked Texts, Reading	Horrid Henry Rocks *(Francesca Simon)*, Moonbird *(Joyce Dunbar)*, The Pied Piper of Hamelin *(Natalia Vasquez*	**Key Scientists**	Miller Reese Hutchinson (Inventor of the hearing aid) Aristotle (Sound Waves), Gailileo Galilei (Frequency and Pitch of Sound Waves), Alexander Graham Bell (Invented the Telephone)
Teaching Sequence: **Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time** **Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching**			
OCER	To identify how sounds are made associating some of them with something vibrating	Explore sounds being made using different objects/materials	
OCE GRD CFT GRD	To explore how sound travels through solids, liquids and gases	Investigate sounds travelling through different mediums. Measure and record data in a table. *How does the length of a piece of string affects how the sound travels and is heard?*	
CFTGRD	To explain how sound changes with distance from	Plan and carry out investigation	

	the sound source	
PS	To identify patterns between the pitch of a sound and the features of an object that produced it	Explore a range of instruments to find patterns between pitch and size/shape of the instrument
CFT **OT**	To understand that the volume of sound is caused by the strength of vibrations that produce it	Investigate ways to protect ears and make suggestions for uses of ear defenders *When is our classroom the quietest? (ongoing)*

Year 4 Science Progression			
Spring 1			
Living things & their habitats 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 pose dangers to living things			
Linked Texts Reading	The Vanishing Rainforest *(Richard Platt),* The Morning I Met a Whale *(Michael Morpurgo),* Journey to the River Sea *(Eva Ibbotson)*	**Key Scientists / Cultural Capital**	Cindy Looy (Environmental Change and Extinction), Jaques Cousteau (Marine Biologist)
Teaching Sequence: **Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time** **Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching**			
PSOCE GRD	To identify and classify different animal groups found in our school grounds.		Revisit prior learning: animal groups
PSOCEGRD R	To identify and name a variety of animals in their habitats (including microhabitats)		Observe and identify animals in their habitats in the local area. Research (ICT) animals and their habitats in the Amazon rainforest.

ICGRD	To group animals in different ways	Sorting and grouping a variety of animals. Venn Diagram
ICGRD	To use a classification key to group animals	Create classification key to identify, name and group animals
R	To name common trees and plants (Year 1 prior learning)	Recap and consolidate knowledge of identifying common trees and plants. ICT research. Ext to identifying trees and plants in the rainforest
ICGRD Making close observations	To use a classification key to identify and name trees	Create classification key to identify, group and name trees.

Year 4 Science Progression

Spring 2

Living things & their habitats

- 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 pose dangers to living things

Linked Texts Reading	The Vanishing Rainforest *(Richard Platt),* The Morning I Met a Whale *(Michael Morpurgo),* Journey to the River Sea *(Eva Ibbotson)*	**Key Scientists / Cultural Capital**	Cindy Looy (Environmental Change and Extinction), Jaques Cousteau (Marine Biologist)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching

R GRD	To explain the balance of nature	Explore challenges to animals in their habitats. Plot line graph to identify correlations in patterns linked to animal populations.
R GRD	To explain how ecosystems can be affected by changes in the environment	Create Food webs for different habitats and use to make statements when one element of the food web is affected
R GRD	To explain the human impact on the environment	Extended research project to describe the impact of

		deforestation
CF R GRD	To explain the impact of air pollution on animals and the environment	Comparative test to investigate causes of air pollution in the local area
R **OT**	To explain the impact of water pollution on animals and the environment	Observing water pollution in the local area (beach walk/clean) Investigating the effects of an oil spill
OT R GRD	To explore ways of conserving water	Investigation to gather data of how much water we use in a week and uses of water. Make suggestions for conserving water.

Year 4 Science Progression

Summer 1

States of Matter

- 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
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Linked Texts Reading	Once Upon a Raindrop: The Story of Water *(James Carter)*, Sticks *(Diane Alber)*	**Key Scientists / Cultural Capital**	Anders Celsius (Celcius Temperature Scale) Daniel Fahrenheit (Fahrenheit Temperature Scale / Invention of the Thermometer)

Teaching Sequence:

Observations over time, **Comparative/fair test**, **Identifying and classifying**, **pattern seeking**, **observing closely using equipment**, **Gathering and recording data**, **Research (knowledge)** **Ideas over time**

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

IC	To compare and group solids, liquids and gases	Revisit prior learning.
Comparative test Close	To explore and understand gases	Explore states of matter in a fizzy drink

observations		
Comparative test	To understand diluting and dissolving	Does diluted washing up liquid produce better bubbles?
OTGRD	To investigate the effect temperature has on changing states of matter	Measuring temperature relating to changing states
OT	To investigate evaporation and condensation	Children to make close observations of the relationship between hot liquids, gases and cold solids.
R	To understand the water cycle	Children to research The water cycle. Create scientific diagram and role-play

Year 4 Science Progression			
Summer 2			
Animals including Humans (Digestion) To describe the simple functions of the basic parts of the digestive system in humans • To identify different types of teeth in humans and their functions • To construct and interpret a variety of food chains, identifying producers, predators and prey			
Linked Texts Reading	Human Body Odyssey *(Werner Holzwarth)* Crocodiles Don't Brush Their Teeth *(Colin Fancy)* Wolves *(Emily Gravett)*	**Key Scientists / Cultural Capital**	Ivan Pavlov (Digestive System Mechanisms), Joseph Lister (Discovered Antiseptic)
Teaching Sequence: **Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time** **Note: Asking relevant questions, measuring, using equipment will be systematically taught and embedded throughout all science teaching**			
R	To identify different types of teeth in humans and their functions	To name different types of teeth in human and describe functions	
CFT	To set up an investigation to understand the causes of tooth decay	Plan an investigation to explore causes of tooth decay	

GRD	To make systematic and careful observations and use these to gather and record data to explore the causes of tooth decay	Take measurements, gather and record data
R	To identify and name parts of the human digestive system	Children to identify and name parts of the human digestive system
OC	To explain the functions of the human digestive system	Children to practically explore the functions of the human digestive system and replicate these with a working model
R	To construct and interpret a variety of food chains, identifying producers, predators and prey	Children to construct a variety of food chains for various habitats

Year 5 Science Progression

Autumn Term 1

Properties and changes of materials

- 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.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Use knowledge of solids , liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- 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

Linked Texts, Reading	Itch *(Simon Mayo),* Kensuke's Kingdom *(Michael Morpurgo),* The BFG *(Roald Dahl)*	**Key Scientists/STEM/ Cultural capital**	Stephanie kwolek (Inventor of synthetic fibres), Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes) Ruth Benerito (Wrinkle-Free Cotton)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

OCE	To make observations and offer suggestions linked to prior learning on materials	Lemonade and raisin investigation: Making close observations

R	To describe the properties of materials	Revisit and consolidate prior learning on materials
IC	To compare and group materials	To investigate the properties of different materials and suggest uses in everyday objects
OCEOT	To understand that some materials dissolve in water to make a solution	How does a sugar cube change when it is added to water?
CFTGRD	To plan a fair test to investigate changes which will affect the speed of sugar dissolving.	How does the temperature of tea affect how long it takes for a sugar lump to dissolve?
CFTGRD	To investigate properties which affect the speed at which materials dissolve to form a solution	What type of sugar dissolves the fastest?
OCE	To explain that some materials can be separated by filtering	Filtering sand and water and offer ideas when attempting to filter sugar/water solution

Year 5 Science Progression

Autumn Term 2

Properties and changes of materials

- 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.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Use knowledge of solids , liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- 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

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Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

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OT	To explain how some mixtures can be separated through evaporating	How does a container of salt-water change over time? Prediction focus.
Assessme	To apply understanding to separate a mixture using filtering, sieving	How can you separate this mixture of salt, lentils, chickpeas, pasta, paper

nt task	and evaporation	clips? What would you need to do if you added water?
CFTGRD	To explore the thermal properties of materials	What is the best type of cup for keeping a drink warm?
Scientific drawings	To apply knowledge from prior investigations to suggest suitability of materials used to make everyday items	To record ideas using scientific labelled diagrams
CFTOCE	To understand that some changes to materials are not reversible	Plan and carry out investigation to observe chemical changes using balloons
OT IC IOT	To explain the difference between chemical and physical changes	How does a nail placed in salt-water change over time? Compare and group changes based on chemical/physical changes Who was Stephanie Kwolek and how has her work changed our lives today?
CFT	To apply understanding of chemical reactions to create a rocket to launch Father Christmas around the world	Plan investigation to create a mento/coke rocket
IOTR	To understand the importance of chemistry in our lives	What would our world and lives be like if chemistry had not been developed?

Year 5 Science Progression

Spring Term 1

Forces

- 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

Linked Texts, Reading	The Enormous Turnip *(Katie Daynes)*, Leonardo's Dream *(Hans de Beer)*, The Aerodynamics of Biscuits *(Clare Helen Welsh)*	**Key Scientists/STEM/ Cultural capital**	Galileo Galilei (Gravity and Acceleration) Isaac Newton (Gravitation) Archimedes of Syracuse (Levers) John Walker (The Match), Brian Cox

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

Making close observations	To identify a range of forces in action	Revisit prior learning: pushes, pulls, friction, magnetism

R	To explain that unsupported objects fall because of gravity	*Do we need gravity?*
RIOT	To explain Isaac Newton's role in the developing a theory of gravity	Research (ICT) Extended write
Measuring and using equipment	To use a force meter and record measurements in newtons	To measure the amount of force needed to hold support an object and prevent it from being pulled down by gravity
CFTGRD IOT	To explain the effect of friction between moving surfaces	Ogden Trust: Slippy shoes investigation History of friction
Asking relevant questions	To explain the role of friction in everyday life	*Does our world need friction?*
Measuring and making close observations	To make observations on the effects of air resistance	Making observations to the effect of different shaped parachutes. Taking measurements- time

Year 5 Science Progression

Spring Term 2

Forces

- 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

Linked Texts, Reading	The Enormous Turnip *(Katie Daynes)*, Leonardo's Dream *(Hans de Beer)*, The Aerodynamics of Biscuits *(Clare Helen Welsh)*	**Key Scientists/STEM/ Cultural capital**	Galileo Galilei (Gravity and Acceleration), Isaac Newton (Gravitation), Archimedes of Syracuse (Levers) John Walker (The Match), Brian Cox

Teaching Sequence:

Observations over time, **Comparative/fair test**, **Identifying and classifying**, **pattern seeking**, **observing closely using equipment**, **Gathering and recording data**, **Research (knowledge)** **Ideas over time**

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching

CFTGRD	To compare and predict how fast an object will fall	Parachute investigation (prediction focus)

R		
CFTGRD	To explain the effect of air resistance on a falling object	Plan and carry out parachute investigation.
R IOT STEM	To explore the effect of using a lever when applying a force	'What is the best type of lever for catapulting a ping-pong ball?' STEM activity. Plan, design, review
R IOT STEM	To explore the effect of using a pulley to reduce the amount of force needed to move an object	To create a working pulley. 'What is the heaviest load we can lift using a pulley?' STEM activity: Plan, deign, review
R IOT STEM	To explore the effect that gears have on the amount of force needed to move an object	To create working gears and observe the effect each gear has on the others (number of rotations created)
R IOT STEM GRD	To explain the effect of water resistance on moving objects	To design and create a boat to move as quickly as possible through water. Measure and gather data on each design. Make observations and interpret results.

Year 5 Science Progression

Summer Term 1

Earth and Space

- 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

Linked Texts, Reading	The Skies Above My Eyes *(Charlotte Guillain & Yuval Zommer)*, George's Secret Key to the Universe *(Lucy and Stephen Hawking with Christophe Galfard)*, The Way Back Home *(Oliver Jeffers)*	**Key Scientists/STEM/ Cultural capital**	Claudius Ptolemy and Nicolaus Copernicus (Heliocentric vs Geocentric Universe), Neil Armstrong (First man on the Moon) Helen Sharman (First British astronaut) Tim Peake (First British ESA astronaut)

Teaching Sequence:

Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time

Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all

teaching		
Asking relevant questions	To apply prior knowledge of Earth and Space	AFL: Sorting statements True/False/Don't Know Oracy: Explaining ideas
RIOT	To describe the movement of the Earth and other planets relative to the sun in the solar system.	Drama: Role-Play Guided Reading: Nicolaus Copernicus
Scientific drawings	To use a model to describe and compare movements of different planets in space.	Scientific drawing to describe movement of planets. STEM: Paper mache solar system model/Playdough planets
CFTGRD Measuring using equipment	To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	Ogden Trust: Sun Shadows Investigation
GRD Asking relevant questions	To present and interpret data gathered throughout the sun shadows investigation.	Ogden Trust: Sun Shadows Investigation
RIOT Scientific drawings	To describe the movement of moon relative to the Earth.	Explanation writing to describe movement and phases of the moon. Guided Reading. History: Timeline of Moon landings

Year 5 Science Progression			
Summer Term 2			
Living Things and their habitats • 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			
Linked Texts, Reading	The Land of Neverbelieve *(Norman Messenger)* Mummy Laid an Egg *(Babette Cole)*	**Key Scientists/STEM/ Cultural capital**	James Brodie of Brodie (Reproduction of Plants by Spores) David Attenborough (Naturalist and Nature Documentary Broadcaster)
Teaching Sequence: **Observations over time, Comparative/fair test, Identifying and classifying, pattern seeking, observing closely using equipment, Gathering and recording data, Research (knowledge) Ideas over time** **Note: Asking relevant questions, making close observations, measuring, using equipment will be systematically taught and embedded throughout all teaching**			
OT	To describe how plants can reproduce both sexually		Observe over time the growth of

	and asexually	Strawberries, potatoes and a plant from a cutting
R	To describe the life cycle of birds	Research the general life cycle of birds
R GRD	To compare the life cycle of different species of birds	Research two different species of birds and compare. Record data in a venn diagram
R	To research the life cycle of a butterfly	Create a detailed scientific diagram to represent the lifecycle of a butterfly
R GRD	To compare life cycles of birds, mammals, insects and birds	Research and compare life cycles of different animals
PS	To identify patterns in life cycle data	To interpret data relating to gestation periods/life span in relation to size of animal. Looking for patterns.

Year 6	
Autumn 1	**Autumn 2**
Animals (including Humans)- Blood and transportation • ***Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood*** • ***Describe the ways in which nutrients and water are transported within animals, including humans*** • ***Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function*** **Lesson 1:** Describe the composition of blood	**Light** ☐ ***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*** **Lesson 1:** Explain how light travels in a straight line and

Lesson 2: Describe how oxygen is moved around the body **Lesson 3:** Explain how blood is filtered **Lesson 4:** Describe what a blood transfusion involves **Lesson 5-** Describe how diabetes is managed **Lesson 6**: Describe the roles of bacteria	shadows are formed **Lesson 2:** Compare materials of different transparencies **Lesson 3-** Describe how lenses can be used **Lesson 4-** Explain how water can bend light **Lesson 5-** Explain that white light is a spectrum of colours and know that we can use a prism to refract light **Lesson 6-** Investigate light colour mixing

Year 6	
Spring 1	**Spring 2**
Evolution & Inheritance ***Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago .*** ***Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents*** ***Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution*** **Lesson 1:** Explain how adaptions help animals and plants survive **Lesson 2:** Describe the process of natural selection **Lesson 3:** Explain what fossils can tell us **Lesson 4:** Explain why animals can look different to their parents **Lesson 5-** Explore the life and work of palaeontologist Mary Anning **Lesson 6**: Describe the process of genetic modification	**Living Things & Their Habitats** • ***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.*** **Lesson 1:** Understand that living organisms are classified into groups called kingdoms **Lesson 2:** Explore and differentiate between the kingdoms of life **Lesson 3-** To understand how living things are classified into different groups and to describe the work of Carl Linnaeus **Lesson 4-** To describe different types of fungi **Lesson 5-** Identify different classes of vertebrates **Lesson 6-** Explore soil habitats

Year 6	
Summer 1	**Summer 2**
Electricity ***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***	**Animals (Including Humans)- Heart and Health** ***Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function*** ***PSHE/RSE*** ***Describe the ways in which nutrients and water are***

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.*** **Lesson 1:** Understand that electricity involves a charge of electrons and understand static electricity **Lesson 2:** Describe the parts of an electric circuit **Lesson 3:** Explain what affects the output of a circuit **Lesson 4:** Explain how variable resistors can work like a switch **Lesson 5-** Compare electrical conductors and insulators and explain how to use electricity safely **Lesson 6**: Design and make a set of traffic lights or some other useful circuit	***transported within animals, including humans*** **Lesson 1:** Describe how nutrients and water are transported within animals **Lesson 2:** Explore the work of William Harvey to understand that fatty deposits can clog blood vessels and cause a heart attack **Lesson 3-** Describe the four chambers of the heart and explain how the heart moves blood around the body **Lesson 4-** To describe what affects the heart rate – blood pressure and pulse **Lesson 5-** Explore the different food groups and identify ways to eat a balanced diet **Lesson 6-** Describe the consequences of an unhealthy lifestyle

Science: Knowledge Organisers

Year 1

Science

Seasonal Changes

What We Need To Know	
What is a season?	The year is divided into four parts according to the weather and amount of daylight hours. Each part is called a season.
Does the whole world have the same seasons?	No. The top half of the world (Northern Hemisphere) have seasons at different times compared to the bottom half of the world (Southern Hemisphere). Some parts of the world do not have seasons like us in the UK.
Where are we?	In England, in the UK, in the Northern Hemisphere

Key Vocabulary and Phrases	
Weather	The conditions outside – wind, rain, sun, snow, warm, cold, hot
Temperature	The measure of how hot or cold something is
Season	The part the year is divided into

Season	Weather and Daylight	Changes to Deciduous Trees
Autumn	Temperatures gradually get colder The weather changes often Approximately 12 hours of daylight per day	 Leave begin to turn yellow, orange, red and brown and fall from the tree.
Winter	Temperatures are at the coldest Weather is normally wet, windy and cloudy at the beginning of the season becoming much drier towards the end. Approximately 8 hours of daylight per day	 Trees are bare without leaves. Branches and twigs are most visible.
Spring	Temperatures begin to get warmer Approximately 13 hours of daylight per day	 New leaves and buds begin to grow.
Summer	The warmest and sunniest of the seasons Thunderstorms are more likely in the summer Approximately 16 hours of daylight per day	 Trees appear full with leaves.

Year 1

Science

Working Scientifically – Seasonal Changes

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
observe closely	Use senses to watch what happens
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
sort and group	Organise plants by their features (e.g. colour, size, shape).
observe changes over time	Observe the growth of plants and vegetables.
diagram	A labelled picture
record	Drawings, diagrams, photos, writing and numbers to show what I have found out.

What I could investigate

How much rain falls in October compared to April and June?

How many hours of daylight are there in Summer compared to Winter?

Equipment I could use

Rain gauge

Pencil and paper

Camera

Daytime hours chart

How I could record my findings

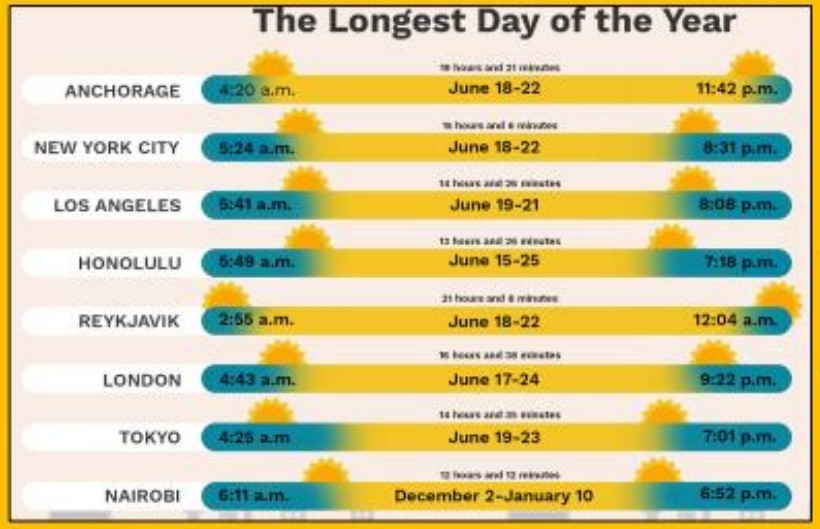
Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Table
For FAIR TESTING/PATTERN SEEKING

What I Change	What I measure

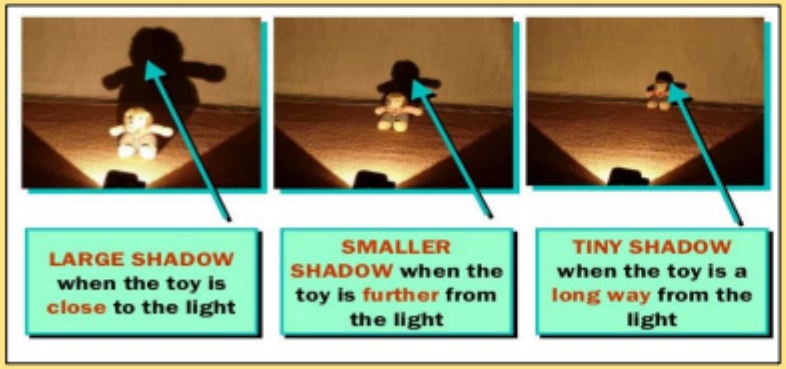
Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words



Year 3

Science

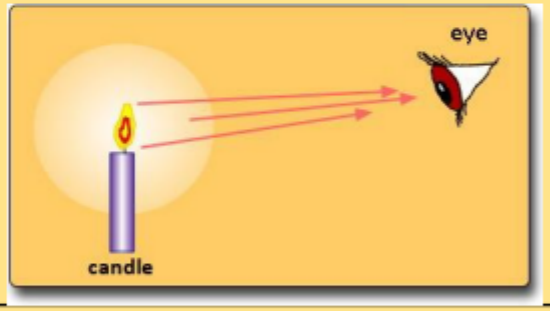
Light

What We Need To Know	
We need light in order to see things because light reflects from objects surfaces. When light is absent, we call it dark.	
What is a light source?	A source of light is something that makes its own light.
Names of light sources:	The Sun, the stars, fire, lights powered by electricity, lights powered by batteries (torches) and some animals such as fireflies and glow-worms
Objects that you may think are light sources but in fact do **not** make their own light:	The Moon A mirror Shiny objects like aluminium foil. **These object's surfaces reflect light from a light source.**
How are shadows formed?	When light from a source is blocked by an opaque object, you get a shadow.
How does the size of the shadow change?	If an object is moved closer to the light source, the shadow gets bigger. If an object is moved further away from the light source, the shadow gets smaller. 
WARNING!	NEVER LOOK DIRECTLY AT THE SUN EVEN WHEN WEARING SUNGLASSES!

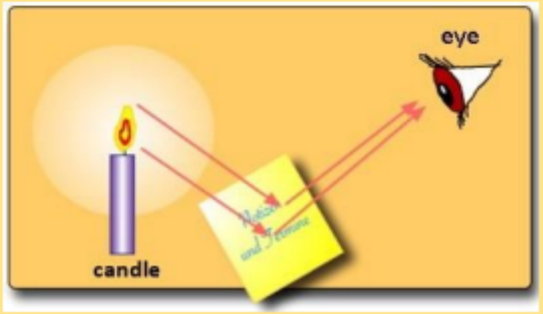
Key Vocabulary and Phrases	
Absent	missing
Opaque	An object you are not able to see through. Light does not travel through it.
Warning	Something that is said or written to tell people of danger.
Source	A thing from which something starts.
Electricity	A form of energy that provides power to devices.
Reflection	When light bounces off a surface.
Dark	The absence of light.

We see objects when light from a source enters our eye.

Light travels directly from a light source (the candle flame) into your eyes.



Light travels from the light source, bounces off the object (the paper) and into your eyes, so that you see the object.



Year 3

Science

Working Scientifically – Light

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Table
For FAIR TESTING/PATTERN SEEKING

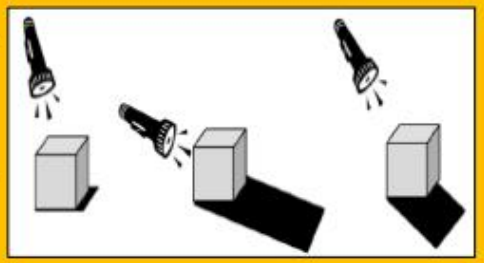
What I Change	What I measure

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

What I could investigate

What materials block light? Investigate the best materials to make a shadow puppet.

How do shadow sizes change?



How do mirrors reflect light?

Equipment I could use

Chalk to draw around the shadow outline.

Translucent, opaque and transparent materials to see which block light.

Torches to shine through the materials.

Bendable mirrors to investigate reflecting light.

A camera

Pencil and paper

Year 4

Science

Sound

Changing Sound

Volume

The closer we are to the sound source, the louder the sound will appear to us. The further away we are from the sound source, the quieter the sound will appear

The more energy in the initial vibration, the louder the sound will be. For example, if you tap a hammer on a desk, the sound will be quiet, but if you smash a hammer on a desk it will be much louder because of the greater force being applied.

Pitch

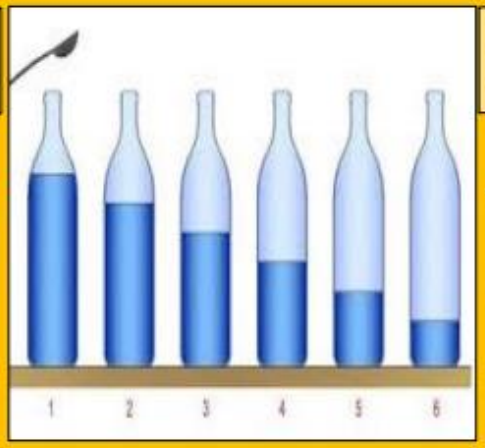
The pitch is how high or low a sound is.

The shorter the vibrating object or column of air, the higher the pitch of the sound.

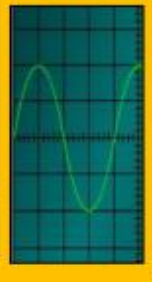
The longer the vibrating object or column of air, the lower the pitch of the sound.

With string instruments, the tighter the string, the higher the pitch of the sound.

highest pitch



lowest pitch



What We Need To Know

What is a sound?	A noise that can be heard.
How is a sound made?	A sound happens when something vibrates. This can be obvious: Like when a drill is hitting the ground repeatedly which causes a loud noise This can be less obvious: Like when blowing air into a bottle, the bottle vibrates to produce the noise.
How do sounds travel?	Sounds can travel in two ways: Through the air - like from a TV speaker across the room to your ears Through an object/material - like stone, brick, water and glass. If someone moves furniture upstairs, the sound can travel through the floor to you.

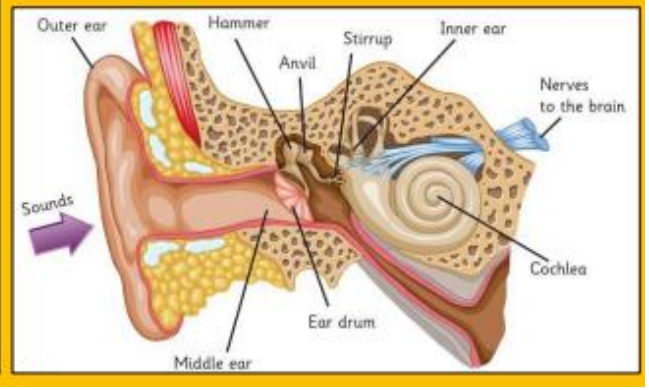
Key Vocabulary and Phrases

Vibrates	Move continuously very quickly back and forth
Volume	The volume of sound is how loud or quiet the sound is
Pitch	
Sounds	Are vibrations that travel through the air.

How do we hear vibrations?

The vibrating air hits our ear drums and makes them vibrate too.

The vibration is picked up by our brains and converted to sounds we recognise.



Year 4

Science

Working Scientifically – Sound

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
Diagram/ model	A labelled picture / a 3D representation of the real item
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Line Graph
For FAIR TESTING

Use this if you have continuous (numerical) data for both axes e.g. mass on an elastic band & how long it is or are measuring over time

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

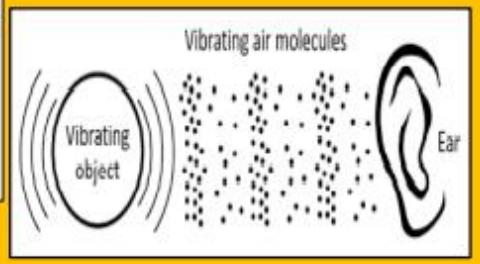
Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

What I could investigate

Does the size of pinna affect how we hear sounds?

What material creates the best ear defenders?

How are sounds made?



Equipment I could use

A variety of different materials to test sound absorption

Instruments

Paper to create pinna

A camera, pencil and paper to record findings

Year 4

Science

Electricity

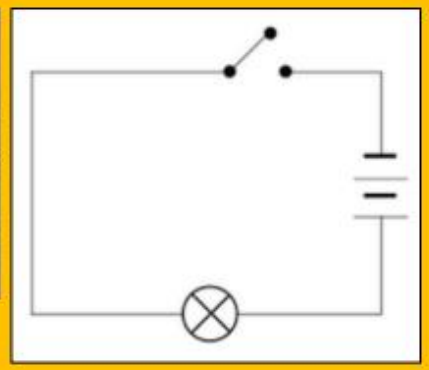
What We Need to Know

What is electricity?	Electricity is created by generators which can be powered by gas, coal, oil, wind or solar. The electrical energy can be converted into other types of energy such as light, heat, movement or sound. Electricity is dangerous, so be careful when using electrical appliances.
What are common appliances that function on electricity?	Any appliances that need to be plugged in functions on electricity. For example: a television, a computer, a microwave, lights.
What is an electrical circuit? A series circuit (One pathway around the circuit)	Electricity can flow through the components in a complete electrical circuit. A circuit always needs a power source, such as a battery, with wires connected to both the positive (+) and negative (-) ends. (A battery is made from a collection of cells connected together). A circuit can also contain other electrical components, such as bulbs, buzzers or motors, which allow electricity to pass through. Electricity will only travel around a circuit that is complete. That means it has no gaps.

wind turbine

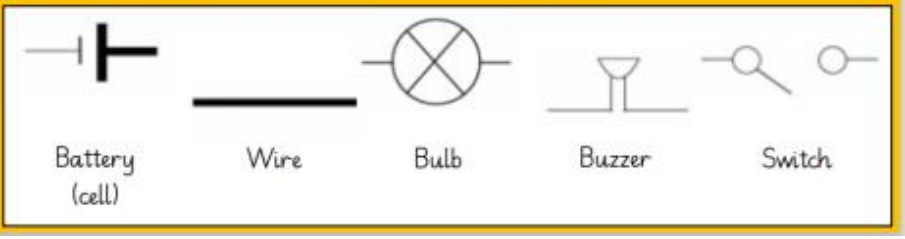
burning fossil fuels

solar panels



Key Vocabulary and Phrases

Generator	A machine that make electrical energy
Component	A part of something (a part of a circuit)
Circuit	A **complete** and **closed** path through which an electrical **current** flows.
Current	The flow of electrical charge
Connected	Something that is joined or linked
Electrical conductors	Some materials let electricity pass through them easily. They are known as electrical conductors. Many metals, such as iron, copper and steel, are good electrical conductors
Electrical insulators	Some materials do not allow electricity to pass through them. They are known as electrical insulators. Wood, glass, plastic and rubber are good electrical insulators. That is why they are used to cover materials that carry electricity.
Switch	Electrical component that is used to create a gap to switch circuits off. It can be closed to turn circuits on.



Year 4

Science

Working Scientifically – Electricity

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
Diagram/ model	A labelled picture/ a 3D representation of the real item
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How I could record my findings

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For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Line Graph
For FAIR TESTING

Use this if you have continuous (numerical) data for both axes e.g. mass on an elastic band & how long it is or are measuring over time

Carroll Diagram
For CLASSIFYING/GROUPING

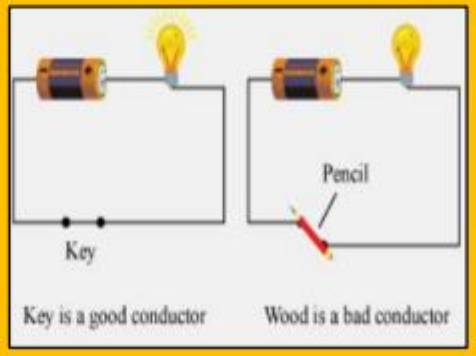
	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

What I could investigate

Do bulbs get brighter if more cells are added?

Are all materials conductors of electricity? Which material makes the best switch?



Equipment I could use

electrical wire

A bulb and battery

Paperclip and lollipop sticks

Camera, pencil and paper to record what I find out.

Year 5

Science

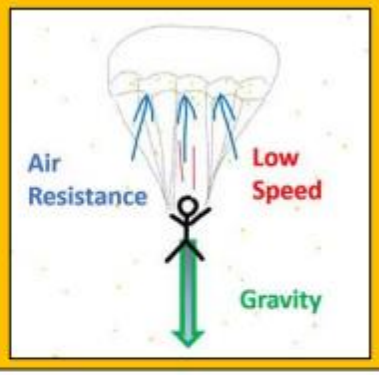
Forces

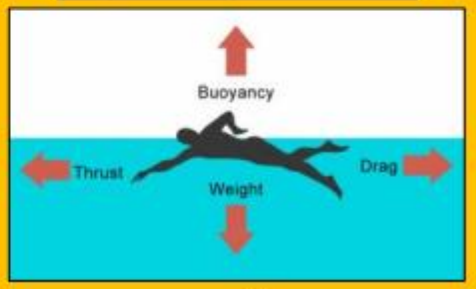
What We Need To Know

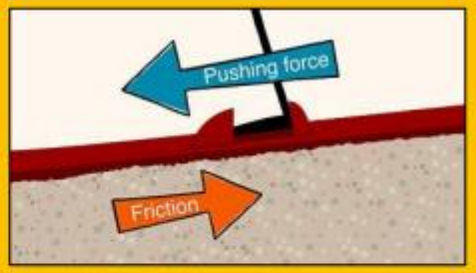
What is a force?	A force is either: a push or a pull.
What do forces do?	Forces can make objects: speed up, slow down, change shape or change direction.

Examples of Forces

A lady is pushing a car to speed it up.	
A man is pulling a dog to slow it down.	
A can is being squeezed (pushed) so it changes shape.	
The racket has hit (pushed) the ball to change its direction.	





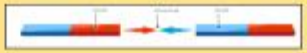


Levers, pulleys and gears allow a smaller force to have a greater effect

Key Vocabulary and Phrases

Streamlined	A shape that presents least resistance to air or water
Surface	The top layer of something
Grip	To have a good connection with a surface
Drag	To cause to slow down
Centre	The middle

Types of Forces

Magnetism (Year 3)	Magnets attract or repel each other or other objects Attract:  Repel:  North and South attract whereas North and North or South and South will repel.
Air Resistance	Air resistance slows down moving objects, because air slows you down as you move through it. To travel faster through the air, things need to be streamlined.
Water Resistance	Water resistance slows down moving objects, because water slows you down as you move through it To travel faster through the water, things need to be streamlined.
Friction	Friction happens when two surfaces touch each other. It gives us grip. It produces heat. Rougher surfaces slow objects down a lot whereas smoother surfaces do not slow objects down as much.

Year 5

Science

Working Scientifically – Forces

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Line Graph
For FAIR TESTING

Use this if you have continuous (numerical) data for both axes e.g. mass on an elastic band & how long it is or are measuring over time

Bar Chart
For FAIR TESTING

Use this if you have only 1 set of numerical (continuous) data and the other is words, e.g. type of material and volume of water it can hold

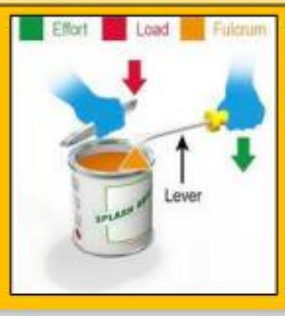
Collect data and identify trends

What I could investigate

Does the size of surface area of a parachute area affect the speed the object falls?

Investigate the best surface area for a foil boat to float

Investigate levers and pulleys



Equipment I could use

Weights for testing whether gravity is affected by mass

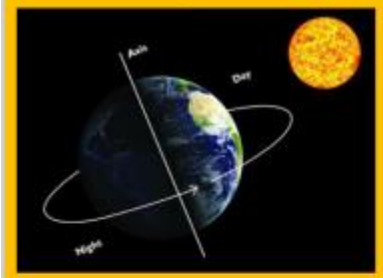
Different materials, such as sand paper and aluminium foil to test how much friction is created through different materials.

Water to test the buoyancy of different objects.

Year 5

Science

Earth and Space



Day and Night

How else does the Earth move?	The Earth spins on its own axis. The Earth takes 24 hours (1 day) to completely rotate on its axis.
What causes day and night?	The Earth spins once in a day. The side of the Earth facing the Sun is in daytime; the other side of the Earth facing away from the Sun is in night time.
What causes Sunrise and Sunset?	The Sun doesn't move - it is the Earth that moves. Due to the Earth is rotating, the Sun appears to move across the sky as the day goes on.

The Sun and The Solar System

What is the Sun?	The sun is a star at the centre of our solar system.
What is the solar system?	The solar system is the collection of eight planets and their moons that orbit round the sun (which is actually a star).
WARNING!	NEVER LOOK DIRECTLY AT THE SUN EVEN WHEN WEARING SUNGLASSES!

Other Planets in the Solar System

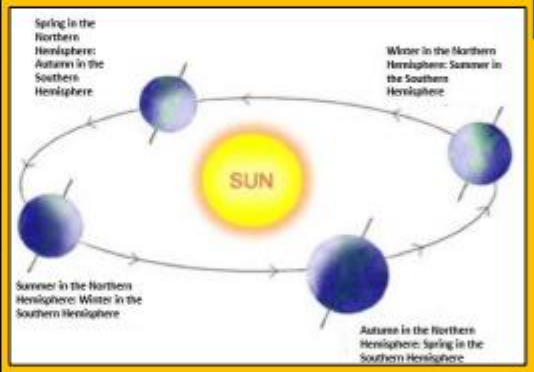
The other planet in the Solar System are Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Nepture (Pluto was reclassified as a dwarf planet in 2006). Each planet has their own orbit around the sun that differs from that of Earth.

Earth has one moon; Jupiter has 4 large moons and numerous smaller moons

WARNING!	NEVER LOOK DIRECTLY AT THE SUN EVEN WHEN WEARING SUNGLASSES!

The Earth - Year Length and Seasons

The Earth takes 365 and a quarter days to orbit (go around) the Sun. Due to the extra quarter day it takes to orbit the Sun, every four years on Earth is a leap year! The Earth is held in its orbit round the Sun by the Sun's gravitational pull. It is the Earth's tilt that causes the seasons.



The Moon

A moon is a celestial body that orbits a planet. The Earth has one moon; Jupiter has four large moons and numerous small ones. The Moon orbits the Earth anticlockwise and takes approximately 28 days. The Moon spins once on its axis every time it orbits Earth. This means that we only see one side of the Moon. The Moon has different phases depending on where it is in its orbit. The Moon's gravity causes high and low tides.

Key Vocabulary and Phrases

axis	An imaginary line through the middle of something
orbit	The curved path in space that is followed by an object going round and round a planet, moon, or star
planet	A large, round object in space that moves around a star
Spherical body	An object that is in the shape of a sphere. The Sun, the Earth and the Moon are approximately spherical bodies, meaning they are almost the shape of a sphere.

Year 5

Science

Working Scientifically – Earth and Space

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

What I could investigate

Describe and compare the movement of Earth and other planets relative to the sun

Are shadows the same size throughout the day? Create a shadow clock

Equipment I could use

Sun dials for observing and tracking the position of the sun.

Plasticine for creating models of the solar system.

Chalk for measuring the size and shape of shadows.

Chromebooks for researching

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Pie Chart
For SURVEYING

Use this to show how objects there are as part of a whole, e.g. numbers of pupils with blue eyes, green eyes, brown eyes etc.

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

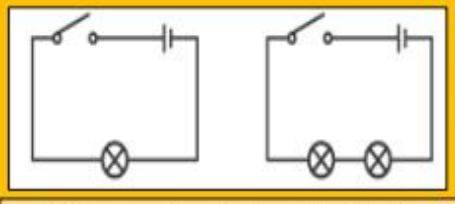
Year 6

Science

Electricity

Prior Knowledge from Year 4 Electricity	
What is electricity?	**Electricity** is an energy. This energy can be used to power electrical items. Electrical energy is caused by electrons (the particles in atoms) moving about to make a current.
Circuits	
What is a circuit?	A **complete** and **closed** path through which an electrical **current** flows.
What is current?	The flow of electrical charge which is a result of charged particles moving through a **conductor**.
What is an electrical conductor?	Some materials let electricity pass through them easily. They are known as electrical conductors. Many metals, such as iron, copper and steel, are good electrical conductors
What is an electoral insulator?	Some materials do not allow electricity to pass through them. They are known as electrical insulators. Wood, glass, plastic and rubber are good electrical insulators. That is why they are used to cover materials that carry electricity.
What is voltage?	Voltage is an **electrical force** that **pushes** current around a circuit and is measured in "**Volts**"

Series Circuits

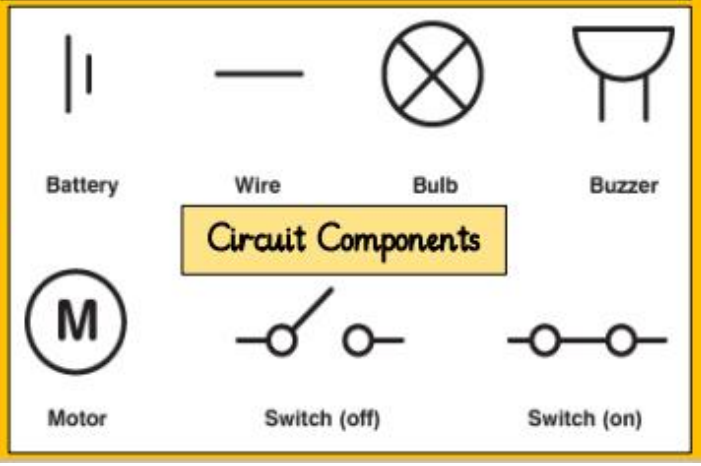


Series circuits only have 1 path for electrical current to flow around, all components are placed after each other in a "Series".

Dangers of Electricity

Electricity has the power to cause burns, shocks and even death. Appliances and power cords can be just as dangerous as electrical power lines if you do not take proper safety precautions. Electricity flows easily through water, and it will travel through your body since your body is made of 70 percent water.

You should never: Stick metal objects in a plug socket or touch electrical items with wet hands.



Components	
Battery	A container consisting of one or more cells where chemical energy is converted into electricity and used as a source of power.
Bulb	A glass bulb which provides light by passing an electrical current through a filament.
Buzzer	An electrical device that makes a buzzing noise and is used for signalling.
Filament	A conducting wire or thread with a high melting point that forms part of an electric bulb.
Motor	A machine powered by electricity that supplies motion for a vehicle or other moveable device.
Switch	A device for making and breaking the connection in an electrical circuit.

Year 6

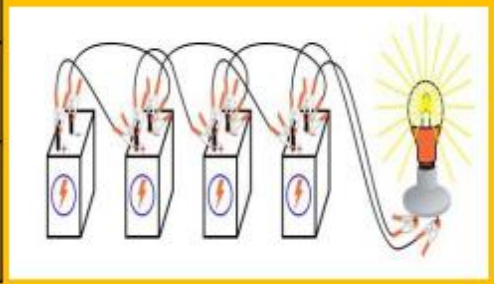
Science

Working Scientifically – Electricity

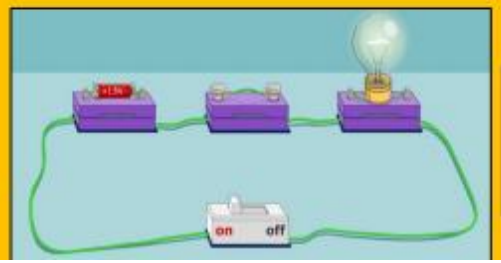
Key Vocabulary and Phrases	
Ask questions	Use the question words **What, where, when why, how**
Compare and contrast	Look at two or more circuits and describe similarities and differences and how the numbers of cells or components vary
Analyse	Explain why variations in the circuits have different effects.
Diagram	Scientific use of symbols to create circuit diagrams
Record data	Drawings, scientific diagrams, photos, tables to record my observations
Reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

What I could investigate

What happens to the brightness of a bulb or loudness of a buzzer when we add more cells or increase the voltage of cells in a circuit?



What will happen when I change the amount of components in my circuit? e.g. adding more bulbs.



Equipment I could use

Battery/Cells

Wire

Bulbs

Buzzer

Switch

PHET online circuit builder

Pencil and paper to record observations and draw circuit diagrams

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Table
For FAIR TESTING/PATTERN SEEKING

What I Change (Independent or Input) Variable	What I measure (Dependent or Output) Variable

A scientific explanation of my findings and conclusions based on my observations.

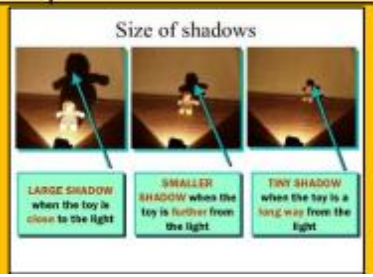
Year 6

Science

Light

Key Vocabulary	
Eyes	Globular organs of sight in the head of humans and vertebrate animals
Reflection	The throwing back by a body or surface of light, heat or sound without absorbing it
Rainbow	An arch of colours visible in the sky, caused by the refraction and dispersion of the sun's light by rain or other water droplets in the atmosphere
Refraction	The bending of light as it passes from one substance to another with the bending caused by the difference in density between two substances
Periscope	An apparatus consisting of a tube of attached to a set of mirrors or prisms through which an observer can see things that are otherwise out of sight

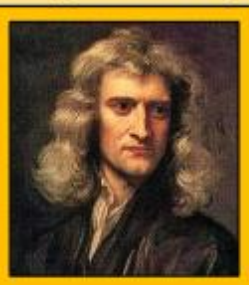
Shadow	
What is a shadow?	A dark area or shape produced by an object in between a ray of light. Shadows have the same shape as the object that cast them



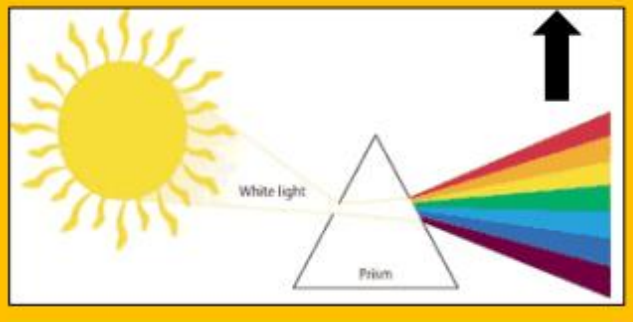
Light	
What is Light?	Something that stimulates your sight and makes things visible.
What is a light source?	Something that provides light, whether it be natural (the Sun) or artificial (a Torch).

Isaac Newton

Although Newton is best known for his work on gravity, did you know he identified that light is made up of a spectrum of colours. He did this by refraction of white light through a prism and saw that different colours of light passed through.



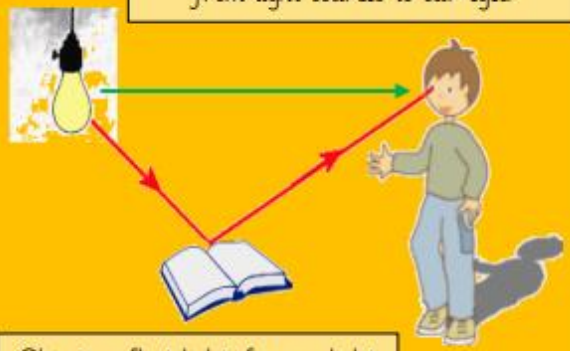
Experience the phenomena of a rainbow



How light travels

Light appears to travel in straight lines.

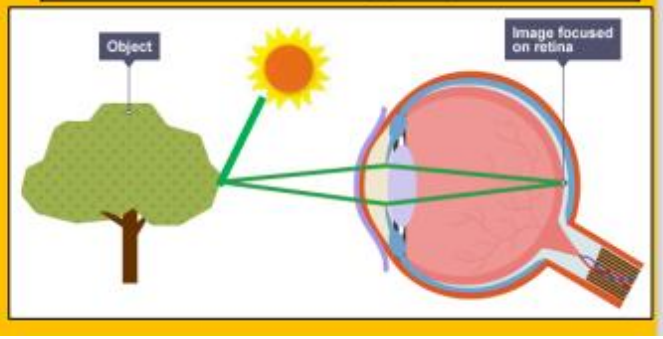
We see things because light travels from light sources to our eyes.



Objects reflect light from a light source to our eyes.

How do we see?

We see objects because they give out light or they reflect light from a light source (Natural / Artificial) into your eyes.



Year 6

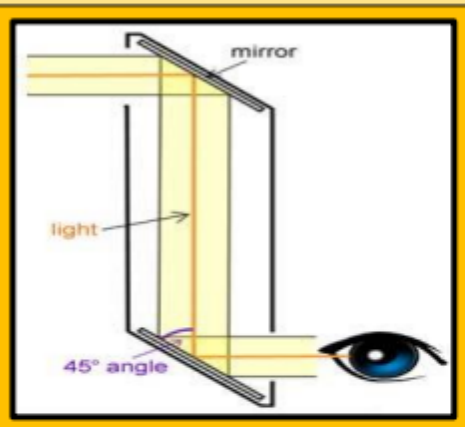
Science

Working Scientifically – Light

Key Vocabulary and Phrases	
Ask questions	Use the question words **What, where, when why, how**
Compare and contrast	Compare and contrast how different coloured light travels through different coloured filters.
Describe and explain	Describe how light travels and explain why. Describe and explain how shadows are cast.
Diagram	To draw diagrams explaining how light travels.
Record data	Drawings, scientific diagrams, photos, tables to record findings.
Reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

What I could investigate

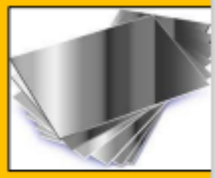
How light travels in straight lines? Design and make a periscope



Explore how shadows are cast

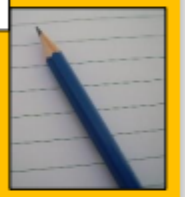
Equipment I could use

Torches



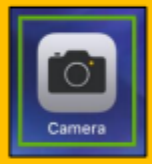
Mirrors

Coloured filters

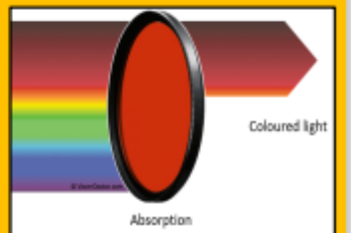


Pen and paper to make observations

Pictures and videos to make analyse and make observations



How is light effected by a range of different materials and external influences? e.g water and coloured filters



How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Table
For FAIR TESTING/PATTERN SEEKING

What I Change (Independent or Input) Variable	What I measure (Dependent or Output) Variable

A scientific explanation of my findings and conclusions based on my observations.

Year 1

Science

Everyday Materials

What?	
What does material mean?	All objects have a name like 'a table'. Material is what the object is made from.

Properties of materials	
Hard	Firm, may not be easily broken or bent
Soft	Easy to cut, fold or change shape
Stretchy	Can be made longer or wider without breaking
Brittle	Breaks or snaps easily
Rigid	Doesn't change shape easily
Shiny	Reflects light easily
Dull	Not very bright or shiny
Rough	Has an uneven surface
Smooth	An even surface with no lumps or bumps
Flexible	Can be bent easily
Waterproof	Keeps out water
Absorbent	Soaks up liquid easily
Transparent	Lets all of the light through – see through
Translucent	Lets some of the light through
Opaque	Does not let light through – not see through

Names of materials
wood
plastic
glass
metal
water
rock

Key Vocabulary	
Properties	A way to describe something
Material	The 'stuff' an object is made out of
Liquid	Liquids can **flow or be poured easily**
Surface	An outside part or layer of something
Object	A thing that can be seen and touched.

Materials and their properties

wood
hard, strong, rigid

metal
shiny, waterproof

plastic
bendy, waterproof

glass
transparent, smooth

water
runny, wet, clear

rock
hard, strong

Year 1

Science

Working Scientifically – Everyday Materials

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
observe closely	Use senses to watch what happens
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
sort and group	Organise materials by their properties
observe changes over time	Observe the absorbency properties of materials
diagram	A labelled picture
record	Drawings, diagrams, photos, writing and numbers to show what I have found out.

How I could record my findings?

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Table
For FAIR TESTING/PATTERN SEEKING

What I Change	What I measure

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

What I could investigate

Equipment I could use

Group materials by their properties

Different everyday materials

What material would be best to mop up a spillage?
Testing absorbency

Sorting rings to sort and group objects

Cups of water

Questions to think about:
Why are objects (example – scissors) made out of certain materials?
Could you make a house out of sand? Why not?
What do you need to wear in the rain? Why? What are those items made of? Why?

Pencil and paper

Egg timers to observe changes over time

Year 2

Science

Uses of Everyday Materials

Uses of materials	
Wood can be used for:	doors, tables
Plastic can be used for:	pens, rulers
Glass can be used for:	windows, glasses
Metal can be used for:	cars, coins
Rock can be used for:	garden walls, old buildings
Rubber can be used for:	tyres,
Brick can be used for:	houses, walls
Paper can be used for:	books, wrapping paper
Card can be used for:	folders, birthday cards
Fabric can be used for:	clothes, towels
Different materials for the same object	
Some objects can be made from various materials	For example, a fork can be made from: plastic, wood or metal.
Inventors	
John Dunlop	He was born in 1840. He was an expert in rubber. He invented the first inflatable tyre.
Charles Macintosh	He was born in 1766. He Invented the first waterproof fabric. The 'mac' raincoat is named after him.

Names of materials
wood, plastic, glass, metal, water, rock, rubber, brick, paper, card, fabric

Key Vocabulary and Phrases	
Various	Lots of different kinds
Inflatable	Can be filled with air
Rubber	A tough material that can be shaped
Fabric	Cloth produced by weaving or knitting

Changing the shape of materials

squashing

bending

twisting

stretching

Year 2 | Science | Working Scientifically – Uses of Everyday Materials

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when, why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features and properties (e.g. colour, size, shape).
diagram	A labelled picture
observe	Look at and notice changes
predict	To say what I think will happen
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy
variable	Something that you are able to change or adapt for example, temperature, position

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Table
For FAIR TESTING/PATTERN SEEKING

What I Change	What I measure

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

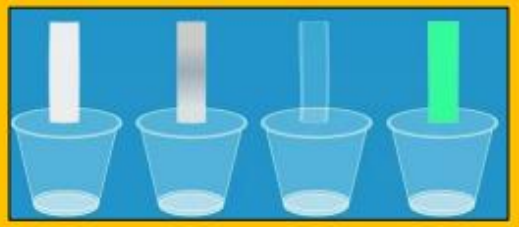
Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

What I could investigate

Which material would be best for an umbrella?

Will the amount of water affect our results?

How properties of materials can be changed.
Does wax affect absorbency?



Equipment I could use

Variety of materials

Measuring cylinders

Cups of water

Wax crayons

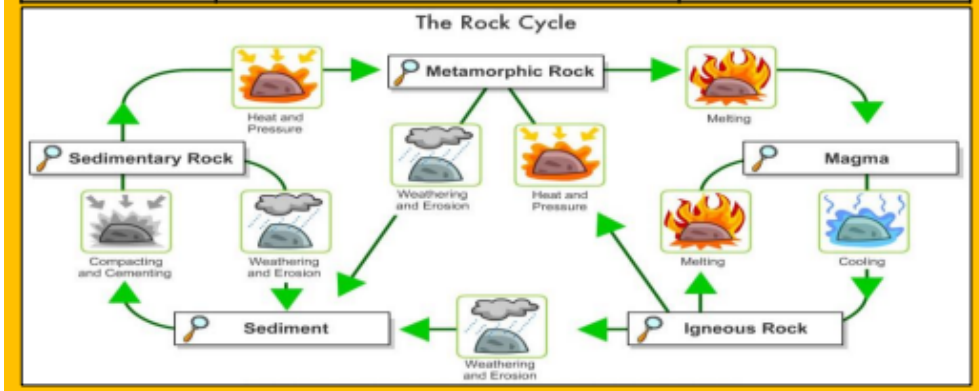
Year 3

Science

Rocks

Key Knowledge

Type	How are they formed?	Features
Sedimentary 	Sedimentary rocks are formed from particles of sand, shells, pebbles, and other fragments of material. Together, all these particles are called sediment. Gradually, the sediment accumulates into layers and over a long period of time hardens into rock.	Usually crumbly and allow water through them Made of layers and stuck together with mineral crystals They can contain fossils within their layers
Metamorphic 	Metamorphic rocks are formed under the surface of the earth from the metamorphosis (change) that occurs due to intense heat and pressure (squeezing).	Usually hard May contain tiny crystals or fossils
Igneous 	Igneous rock is formed when magma cools and solidifies, it may do this above or below the Earth's surface.	Very hard Contain crystals



Key Vocabulary and Phrases

Erosion	The gradual wearing away of something
Magma	Hot fluid below or within the earth's crust from which lava and other igneous rock is formed on cooling
Tectonic plates	A layer under the ground made up of large, moving pieces called plates. All of Earth's land and water sit on these plates.
Solidify	To become solid or hard.
Dissolve	To become part of a liquid

How are fossils formed?

An animal dies, its skeleton settles on the sea floor and is buried by sediment.
The sediment surrounding the skeleton thickens and begins to turn to stone.
The skeleton dissolves and a mould is formed. Minerals crystallise inside the mould and a cast is formed.
The fossil is exposed on the Earth's surface.

What is soil made from?

Minerals (small stone fragments: clay, silt or sand)
Organic Matter (decaying plants and animals)
Water (which the nutrients in the minerals and the organic matter dissolve into)
Air (which fills the gaps between the mineral and organic matter parts).

Types of soil

Sandy soil is pale in colour with lots of small air gaps. Water drains through sandy soil easily so it usually feels quite dry.
Clay soil is an orange or blue-ish sticky soil with very few air gaps. Water does not drain through it easily. When it rains, puddles stay on top of clay soil for a long time.
Chalky soil is a light brown soil. Water drains through it quickly.
Peat is different from other soils because it does not contain any rock particles. It is made from very old decayed plants and is dark, crumbly and rich in nutrients (chemicals plants need to grow).

Year 3

Science

Working Scientifically – Rocks

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise rocks by their features – igneous, sedimentary and metamorphic (e.g. colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Table
For FAIR TESTING/PATTERN SEEKING

What I Change	What I measure

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

What I could investigate

Create a comparative model of igneous, sedimentary and igneous rocks



How permeable are different types of soil?

Classify rocks according to whether they have grains or crystals.

Equipment I could use

A beaker to hold the soil.

A funnel to tip the water in.

Coffee filter paper for the soil.

A measuring cylinder to measure the amount of water.

A camera, pencil and paper to record what I find out.

Year 4

Science

States of Matter

Key Knowledge

Materials ca be grouped into 3 categories: solids, liquids and gases.

Solids
- Solids stay in one place and can be held.
- Most solids keep their shape. They do not flow like liquids. Some solids like sand or salt can be poured.
- Solids always take up the same amount of space. They do not spread out like gases.

Liquids
- Liquids can **flow** or be **poured** easily. They are not easy to hold.
- Liquids change their shape depending on the container they are in.

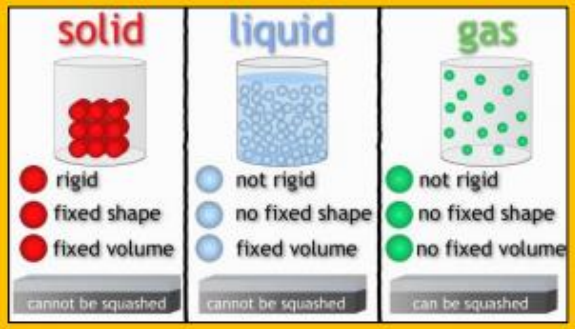
Gases
- Gases are often invisible.
- Gases do not keep their shape. They spread out and change their shape and volume to fill up whatever container they are in.

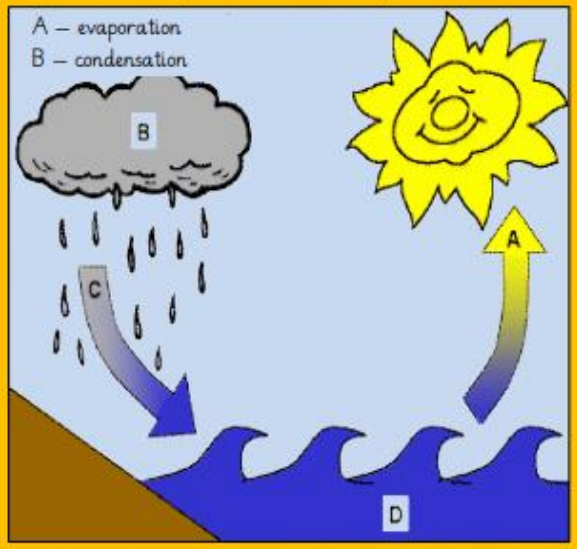
What does **changes of state** mean?
It is when a material changes from one material type to another.

What	Explanation	Name of process	Example
Solid to Liquid	When a solid **melts** it changes to a liquid.	Melting	When an ice cube melts.
Liquid to Gas	A liquid **evaporates** into a gas when it is heated	Evaporation	When water on a fence is warmed up and turns to steam.
Gas to Liquid	When a gas it cooled it **condenses** into a liquid.	Condensation	When steam from the shower cools on the mirror it turns to water.
Liquid to Solid	When a liquid **freezes** it turns into a solid.	Freezing	When the water in a pond freezes, it turns to ice.

Key Vocabulary and Phrases

Temperature	The measure of warmth or coldness of an object.
Celsius	The common scale in the UK for measuring temperature.
Boils	To become so hot (100°C) that water bubbles and then turns into a gas.
Container	Something which holds things inside, like a box, jar or tub





Temperatures

Boiling	Water boils at exactly 100°C (A hot bath is about 40°C)
Melting	Different solids melt at different temperatures: Ice melts at 0 degrees Celcius (0°C). (Chocolate melts at about 35°C)
Freezing	Water freezes at 0 degrees Celcius (0°C).
Evaporation and Condensation	Water can evaporate and condense at any temperature. But, the warmer it is the faster the evaporation takes place.

Year 4 | Science | Working Scientifically – States of Matter

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
Diagram/ model	A labelled picture or a 3D representation of the real item
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Line Graph
For FAIR TESTING

Use this if you have continuous (numerical) data for both axes e.g. mass on an elastic band & how long it is or are measuring over time

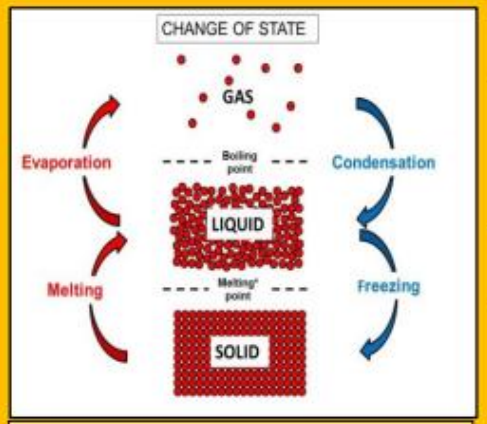
Table
For FAIR TESTING/PATTERN SEEKING

What I Change	What I measure

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

What I could investigate

What effect does temperature have on changing state?



Do all liquids evaporate? What liquid will evaporate more quickly?

Equipment I could use

A thermometer to measure temperature

A variety of liquids to evaporate

Fridge to vary temperature

Ice to change state

Stopwatch to record time taken

A camera, pencil and paper to record findings.

Year 5

Science

Properties and Changes of Materials

Key Knowledge

Comparing and Grouping Materials

Materials can be grouped by their properties (is it hard or soft?) or by more than one of their properties (is it hard and magnetic?).

Properties of materials we can compare

Hard Difficult to scratch, like a metal spoon.	**Soft** Malleable (easily shaped), like play-doh.
Soluble Can be dissolved, like sugar granules.	**Insoluble** Cannot be dissolved, like gravel.
Transparent Lets all light through, like glass.	**Opaque** Does not let any light through, like a brick wall.
Electrical conductor Lets electricity pass through easily, like copper wire.	**Electrical insulator** Does not let electricity flow through easily, like plastic or rubber.
Thermal conductor Lets heat pass through easily, like a metal saucepan.	**Thermal insulator** Does not let heat pass through easily, like a wood pan handle.
Magnetic Is attracted to a magnet, like a steel paperclip. Not all metals attract to magnets.	**Not magnetic** Is not attracted to a magnet, like a wooden ruler.

Reversible Changes	Irreversible Changes
A reversible change is a change that doesn't last forever. For example, water can turn to ice when frozen, but can be turned back to water by heating it. Dissolving, mixing and changes of state are usually a reversible change.	Some changes cause new materials and this kind of change is not usually reversible. An irreversible change lasts forever and is usually caused by heat Example: eggs, flour, butter and sugar heated to make a cake. The original ingredients can't go back to how they started. Some other irreversible changes can be caused by burning.

Key Vocabulary and Phrases

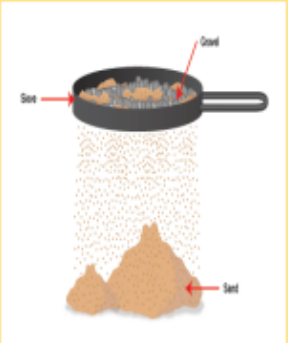
Dissolved	To become incorporated into a liquid so as to form a solution.
Separating	The action of moving things apart.
Evaporation	When a liquid turns to a gas due to an increase in temperature.
Properties	A specific quality of something.

Mixtures and Solutions

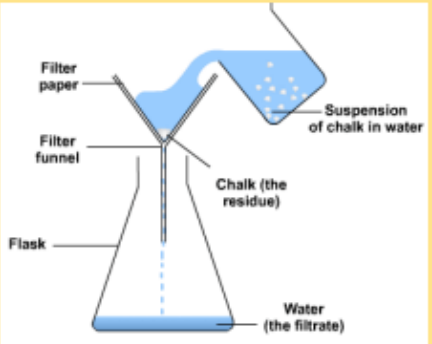
A mixture	A solution
Where substances are mixed together, but dissolving hasn't taken place. For example, mixing, banana slices, grapes and orange segments to make a fruit salad.	Some substances dissolve in a liquid. When this happens the liquid is called a solution. For example, when coffee granules dissolve in water this makes a solution.
We can separate a mixture by sieving and/or filtering **Sieving** - sorting out the big bits from the small bits, e.g. stones from soil. **Filtering** - separating solid bits from a liquid, e.g. sand from sand and water.	We can separate a solution by evaporation Because the soluble substance is too mixed into the water, it can't be removed by sieving or filtering **Evaporation** - A liquid **evaporates** into a gas when it is heated. This removes the liquid.

Separation

Sieving



Filtering



Evaporation

Year 5 | Science | Working Scientifically – Properties and Changes of Materials

Woodside Primary School

Key Vocabulary and Phrases – Amend to make appropriate to Materials	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings?

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

Line Graph
For FAIR TESTING

Use this if you have continuous (numerical) data for both axes e.g. mass on an elastic band & how long it is or are measuring over time

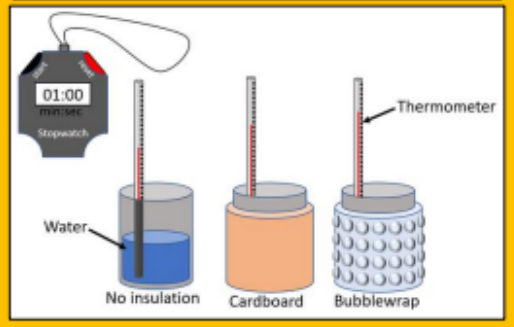
Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

What I could investigate

Compare and group materials based on their properties and suggesting similarities and differences.

What material will keeps a hot drink warmer for longer? Test thermal insulation



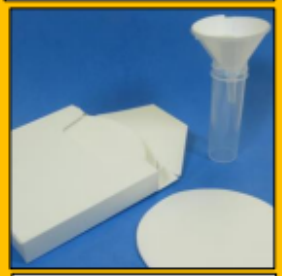
Observe and compare changes that take place when materials are mixed. Do they create reversible or irreversible changes?

Water, Vinegar and Bicarbonate of Soda

Equipment I could use

Magnet for testing whether materials are magnetic.

Filter paper for testing whether materials are soluble.



Sieve for separating materials.

Circuits for testing electrical conductors and insulators.

Thermometers for testing thermal conductors and insulators.

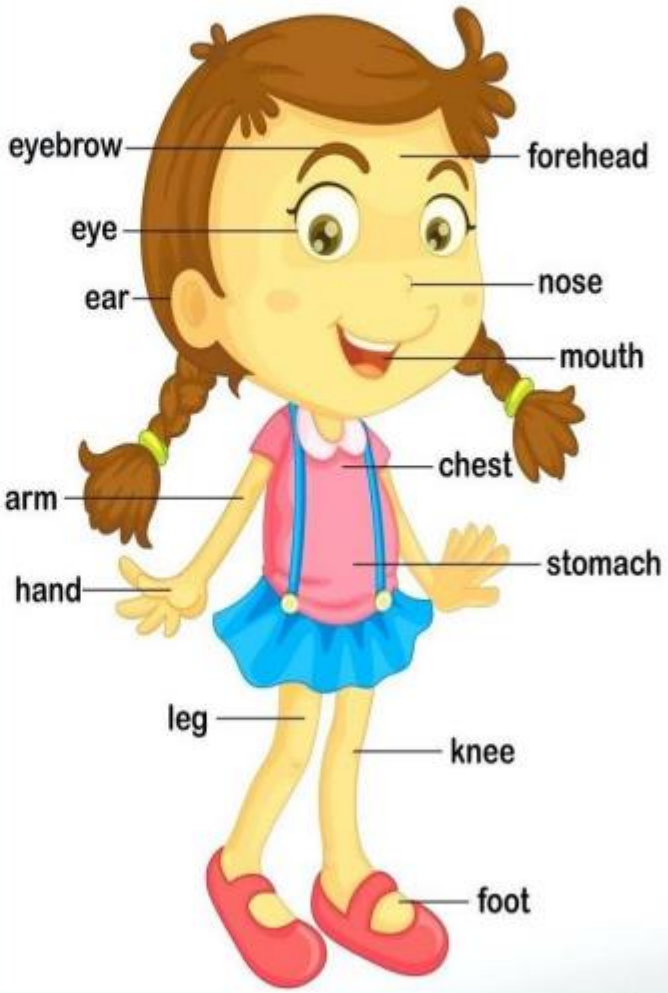
Year 1

Science

Animals Including Humans – Humans

What?	
Human beings	We are called humans We are from the family of animals called mammals
Basic parts of the human body	Hair, head, ears, eyebrows, eyes, nose, mouth, chin, neck, shoulder, chest, elbow, arm, wrist, hand, tummy, knee, leg, ankle and foot
There are 5 basic human senses	Touch, taste, smell, sight and hearing
How do we touch?	We touch using our skin
How do we taste?	We taste with our tongue by putting something in our mouth
How do we smell?	We smell by using our nose
How do we see?	We see by using our eyes
How do we hear?	We hear by using our ears

BODY PARTS



Our Five Senses

Year 1 | Science | Working Scientifically – Humans

Key Vocabulary and Phrases – Amend to suit unit of work	
ask questions	Use the question words **What, where, when why, how**
observe closely	Use senses to watch what happens
compare and contrast	Look at two or more animals and describe similarities (what is the same) and differences (what is different)
sort and group	Organise animals by their features (e.g. colour, size, shape, what they eat).
observe changes over time	Observe the growth of plants and vegetables.
diagram	A labelled picture.
record	Drawings, diagrams, photos, writing and numbers to show what I have found out.

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

What I could investigate

How do our bodies change over time?

Explore your sense of taste, smell and touch blindfolded
Describe the fruit's texture, taste and smell.
What is it?

Explore your sense of sound and smell blindfolded
Go on a sensor walk.
Describe the sounds and smells. What are they?

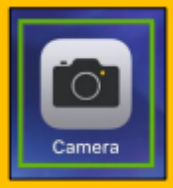
Sort the objects or sound by their descriptions
Textures – soft, hard, bumpy, rough, smooth
Sounds – loud, noisy, piercing, deafening, howling, quiet, muffled, musical, chime, high, low, deep
Smells – sweet, floral, fresh, musty, stale, rancid
Tastes – sweet, sour, salty, spicy, bitter,

Equipment I could use

Photographs

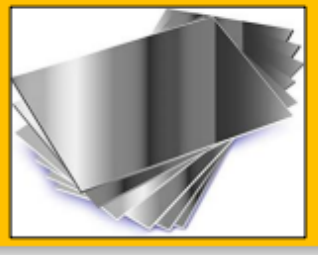
Tape measure

Camera



Senses

Mirrors



Year 1

Science

Animals Including Humans - Animals

What?	
6 types of animals	Invertebrates Fish Amphibians Reptiles Birds Mammals
Some common invertebrates	Crab, jellyfish, worm, bee, spider
Some common fish	Goldfish, cod, shark
Some common amphibians	Frog, toad, newt
Some common reptiles	Snake, crocodile, lizard
Some common birds	Chicken, owl, magpie, blackbird, duck
Some common mammals	Human, dog, lion, horse,
carnivores	Animals that eat meat
Some common carnivores	Lion, tiger, brown bear
herbivores	Animals that eat plants
Some common herbivores	Cow, sheep, rabbit
omnivores	Animals that eat meat and plants
Some common omnivores	Human, pig, rat

Key Vocabulary and Phrases	
Invertebrates	Animals with no back bone
Fish	An animal with gills and fins that lives in water
Amphibians	An animal which can live on land or in water
Reptiles	An animal which has dry, scaly skin and lays eggs on land
Birds	An animal with feathers, wings and a beak that is usually able to fly
Mammals	An animal that feeds its young with milk from the mother and has skin usually more or less covered with hair
Pet	A friendly animal trained to live with humans

Year 1

Science

Working Scientifically – Animals

Key Vocabulary and Phrases – Amend to suit unit of work	
ask questions	Use the question words **What, where, when why, how**
observe closely	Use senses to watch what happens
compare and contrast	Look at two or more animals and describe similarities (what is the same) and differences (what is different)
sort and group	Organise animals by their features (e.g. colour, size, shape, what they eat).
observe changes over time	Observe the growth of animals
diagram	A labelled picture.
record	Drawings, diagrams, photos, writing and numbers to show what I have found out.

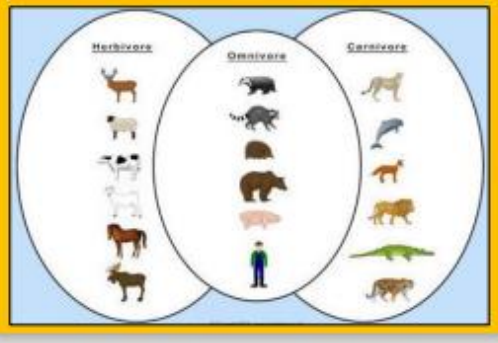
What I could investigate

Explore how animals need to be cared for differently. Compare the similarities and difference of wild animals and pets.

Pets

Wild Animals

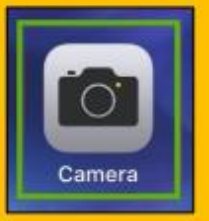
Group the animals into herbivores, omnivores and carnivores



Equipment I could use

Sorting rings to sort and group objects

Camera



Pencil and paper

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

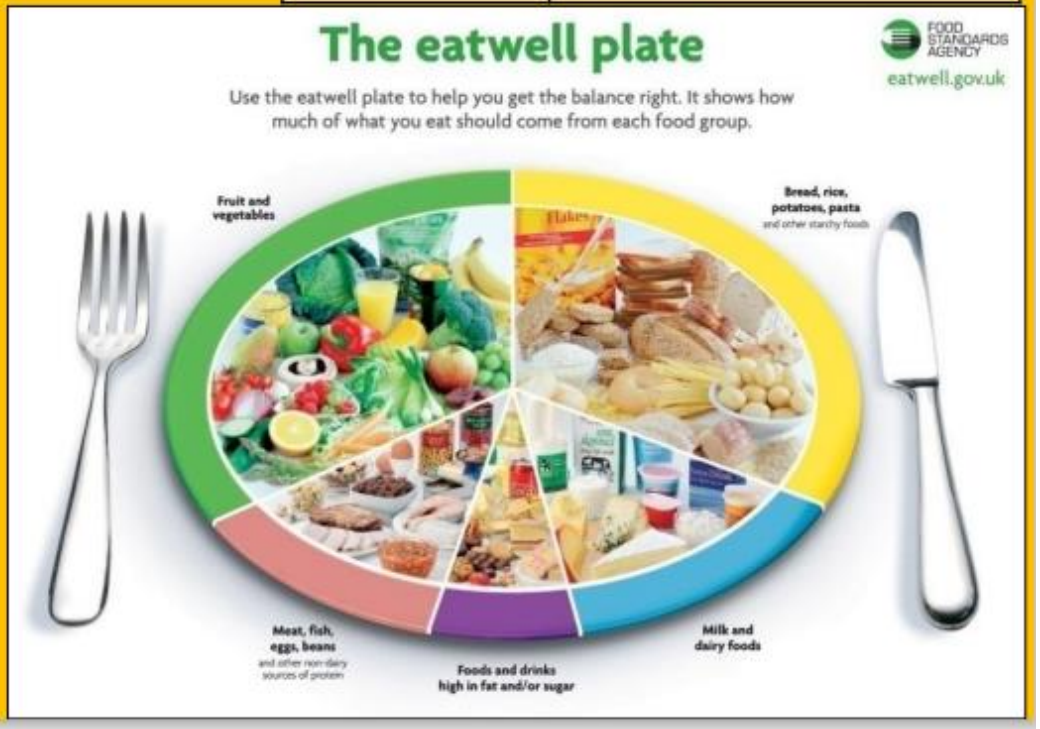
Year 2

Science

Animals Including Humans – Humans

What?	
Growth in animals	animals become older and change as time passes
Human growth	baby > toddler > child > teenager > adult
Things humans need to survive	water, food , air, rest and shelter
Things humans need to be healthy	to have a balanced diet of the right amount of different types of food and drink. to exercise regularly to be hygienic. to rest and have a good night's sleep
What is regular exercise?	adults needs to be active for at least 150 minutes each week and children aged 5 to 16 need to be active for at least 60 minutes each day children under 5 need 3 hours of activity a day
What is good hygiene?	to maintain daily personal hygiene, you should make sure: your hands are washed after you've used the toilet your private parts are washed every day your face is washed daily you're fully bathed or showered at least twice a week your teeth are brushed twice a day
What is rest and sleep?	rest is important for growth and development. children aged 6 to 12 year olds should sleep 9 to 12 hours each night.

Key Vocabulary and Phrases	
Offspring	a person or animal's child or children
Growth	the process of getting bigger
Baby	a very young child
Toddler	a young child that is just beginning to walk
Child	a young person below the age of 13
Teenager	a person aged between 13 and 19
Adult	a grown up

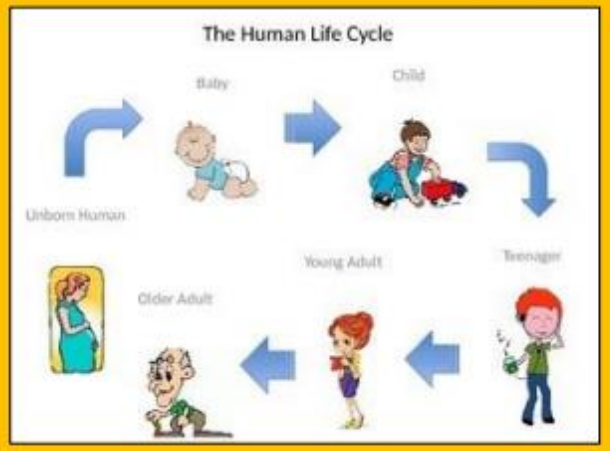


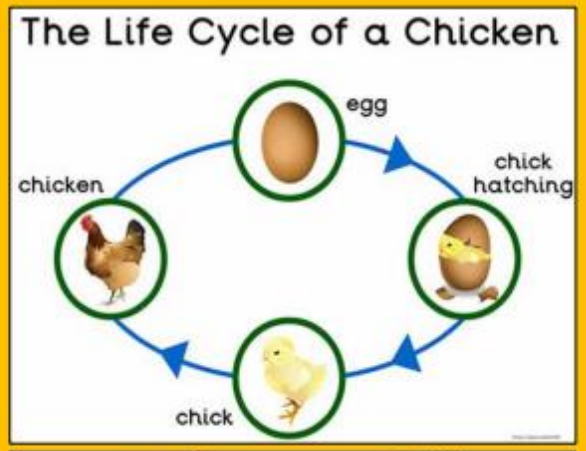
Year 2

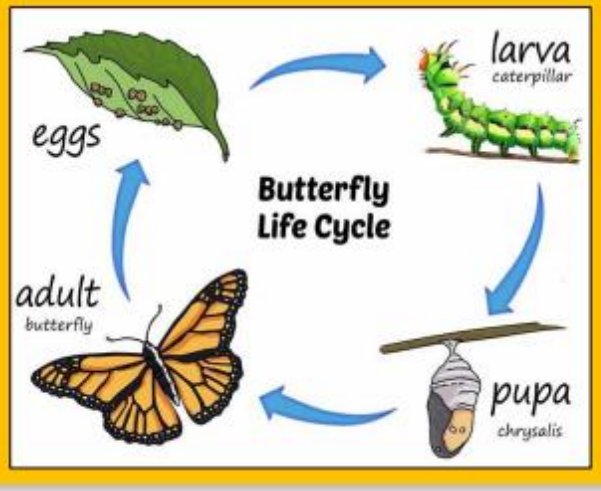
Science

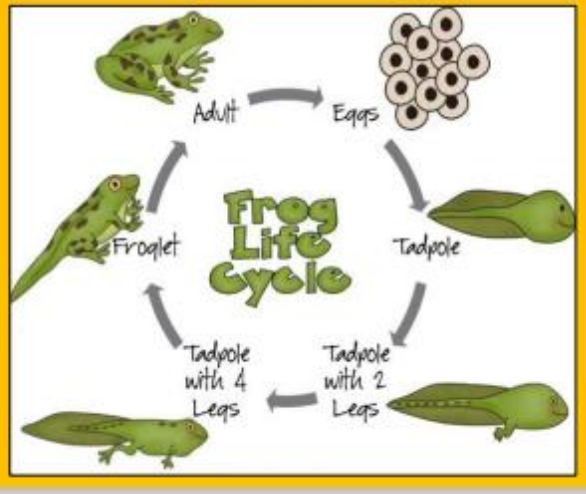
Animals Including Humans

What?	
Growth in animals	animals become older and change as time passes
3 examples of animal growth	•egg > chick > chicken •egg > caterpillar > pupa > butterfly •spawn > tadpole > frog









Key Vocabulary and Phrases	
offspring	a person or animal's child or children
growth	The process of getting bigger
larva	a baby or young insect
pupa or chrysalis	an insect that is about to turn into an adult
female	girl
male	boy
hen	girl chicken
rooster	boy chicken
life cycle	a life cycle is the different stages of life for a living thing
frog	an amphibian
tadpole	a tadpole or polliwog is a young frog that breathes and lives in the water.
adult	a person fully grown
child	a young person
baby	a very young child

Year 2

Science

Working Scientifically – Animals Including Humans

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when, why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings?

Bar Chart
For FAIR TESTING

Use this if you have only 1 set of numerical (continuous) data and the other is words, e.g. type of material and volume of water it can hold

Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

What I could investigate

Is the oldest person the tallest?

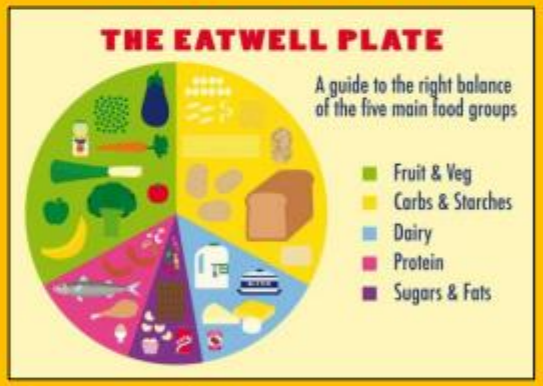
Compare diets - How does diet differ as you age? How is an adult diet different to a children's diet?

Sort foods by food groups

Equipment I could use

Tape measure for measuring height

Scales for measuring weight



Ruler

Pencil and paper

Year 3

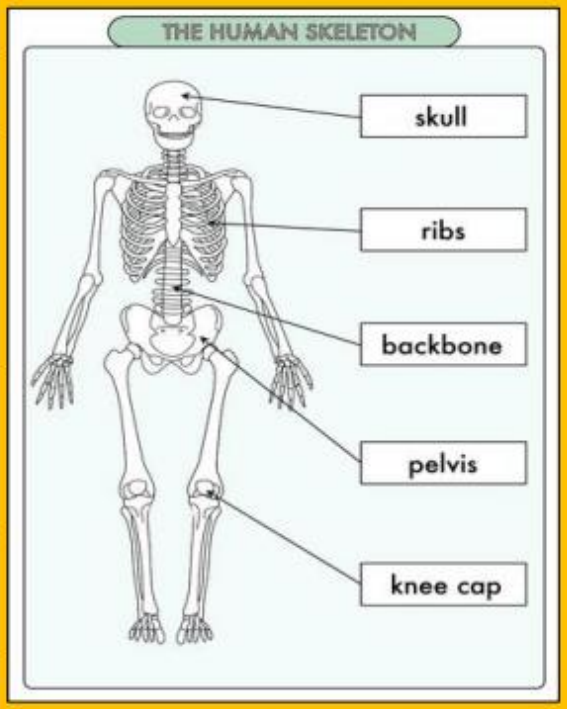
Science

Animals Including Humans

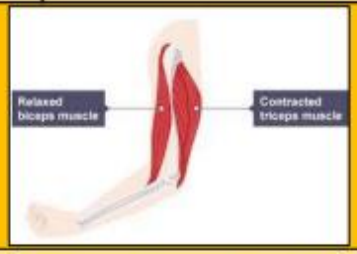
What?	
Things animals and humans need to survive	air (oxygen), water, food, shelter
Things animals and humans need to be healthy	To have a balanced diet of the right amount of different types of food and drink To exercise regularly To be hygienic To have the right amount of rest
Can animals make their own food?	No humans and animals can not make their own food. They have to grow it, hunt for it or gather it.
How do humans grow food?	Humans plant seeds that will grow into food ready for them to harvest.
How do humans and animals hunt?	Animals can hunt other animals to eat however humans tend to farm animals.
How do humans and animals gather food?	Humans and animals can find food grown in the wild to eat

Nutrition humans need includes:

Carbohydrates
Vitamins and Minerals
Protein
Dairy
Fats and Sugars



Key Vocabulary and Phrases	
nutrition	they get nutrition from what they eat
harvest	to collect food from plants
forage	to look for wild food
skeleton	a structure of bones that supports and protects a human and animal's body and vital organs
muscle	soft tissue in the body that contracts and relaxes to cause movement of the skeleton
tissue	a type of natural material plant and animals are made of
contracts	when a muscle shortens sand tightens
relax	When a muscle lengthens



Nutrition animals need vary as they have different diets to survive for examples:

Owls are carnivorous and usually eat invertebrates, fish, reptiles and small mammals where as pigeons are herbivorous and mostly eat seeds and grains while blackbirds (omnivorous) tend to eat worms, fruit and berries. All of these are tyepes of birs, yet their diets differ to meet their nutritional needs and keep them healthy

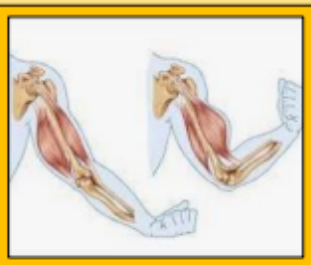
Year 3 | Science | Working Scientifically – Animals Including Humans

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

What I could investigate

Does our height affect our shoe size?

How do our muscles change when we exercise?



What if we had no skeleton?

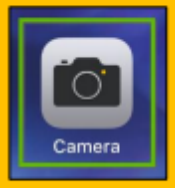
Equipment I could use

A tape measure to measure height.

Sorting hoops to sort different food groups.

A stopwatch to measure the time it takes to exercise.

A camera, pencil and paper to record what I find out.



How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

Table
For FAIR TESTING/PATTERN SEEKING

What I Change	What I measure

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

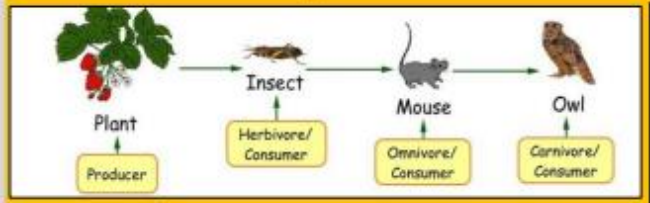
Year 4

Science

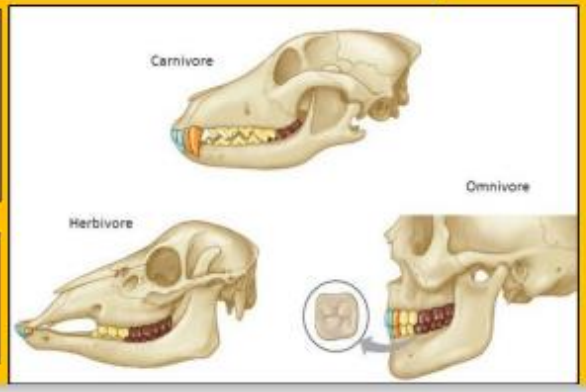
Animals Including Humans

What We Need to Know	
What is digestion?	Digestion is the process of how the body breaks down the food we eat into smaller parts that can be used to give the body energy
The main part of the digestive system	Mouth, tongue, pharynx, oesophagus, liver, stomach, gall bladder, pancreas, small intestine, large intestine,
The journey of food	Humans put food into their mouth Food is chewed by the teeth Food is swallowed and passed through the pharynx and oesophagus to the stomach In the stomach, it is churned into a mixture like soup and mixed with acid The mixture passes into the small intestine, where tiny bits of food pass into the bloodstream The food that is still left goes into the large intestine Finally, waste products leave the body
Facts about teeth	Teeth grow in babies when they are about 6 months old 20 teeth grow by the time you are about 2.5 years old From about age 6 you start to lose teeth till about the age 12 These teeth are replaced by 32 permanent teeth
What is a food chain?	A food chain shows producers and consumers. A consumer can be a predator, prey or both. The arrow means 'is food for'

Key Vocabulary and Phrases	
Energy	What gives humans and animals strength
Waste	Unwanted substances in the body
Faeces	The proper word for poo
Urine	The proper word of wee
Pre-molars and molars	Back teeth for crushing and grinding food
Canines	Long teeth for grabbing food
Incisors	Front teeth for cutting food
Producer	Food chains start with a producer (plant or algae)
Consumer	Get their food from eating plants or other animals
Predator	An animal that eats other animals
Prey	Animals that are eaten by other animals

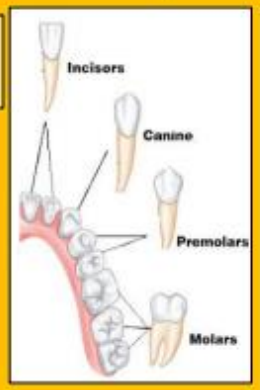


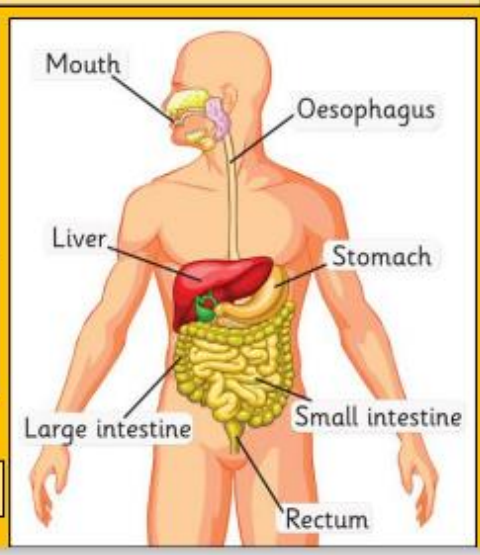
Food chain



Compare the teeth of herbivores, carnivores and omnivores

Human teeth





Digestive system

Year 4

Science

Working Scientifically – Animals Including Humans

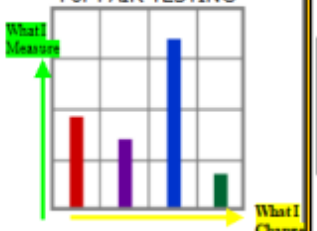
Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
Diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Bar Chart
For FAIR TESTING



Use this if you have only 1 set of numerical (continuous) data and the other is words, e.g. type of material and volume of water it can hold

Carroll Diagram
For CLASSIFYING/GROUPING

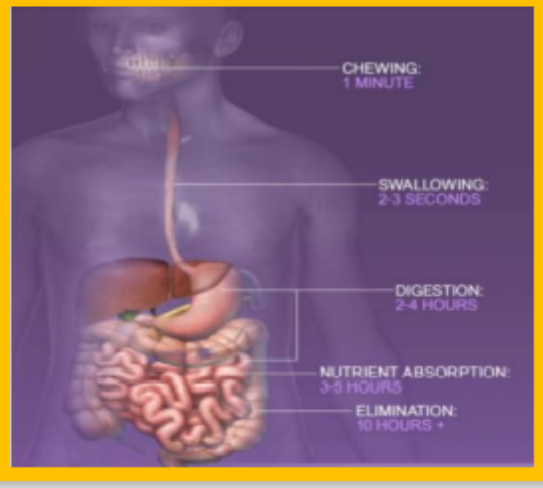
	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

What I could investigate

What causes the most decay to our teeth?

What happens to food from the point it enters your mouth and exits your body? Create and build a labelled model



Equipment I could use

Beakers to contain liquid

Eggs to replicate tooth enamel

A variety of liquids

A camera, pencil and paper to record findings.

Year 5

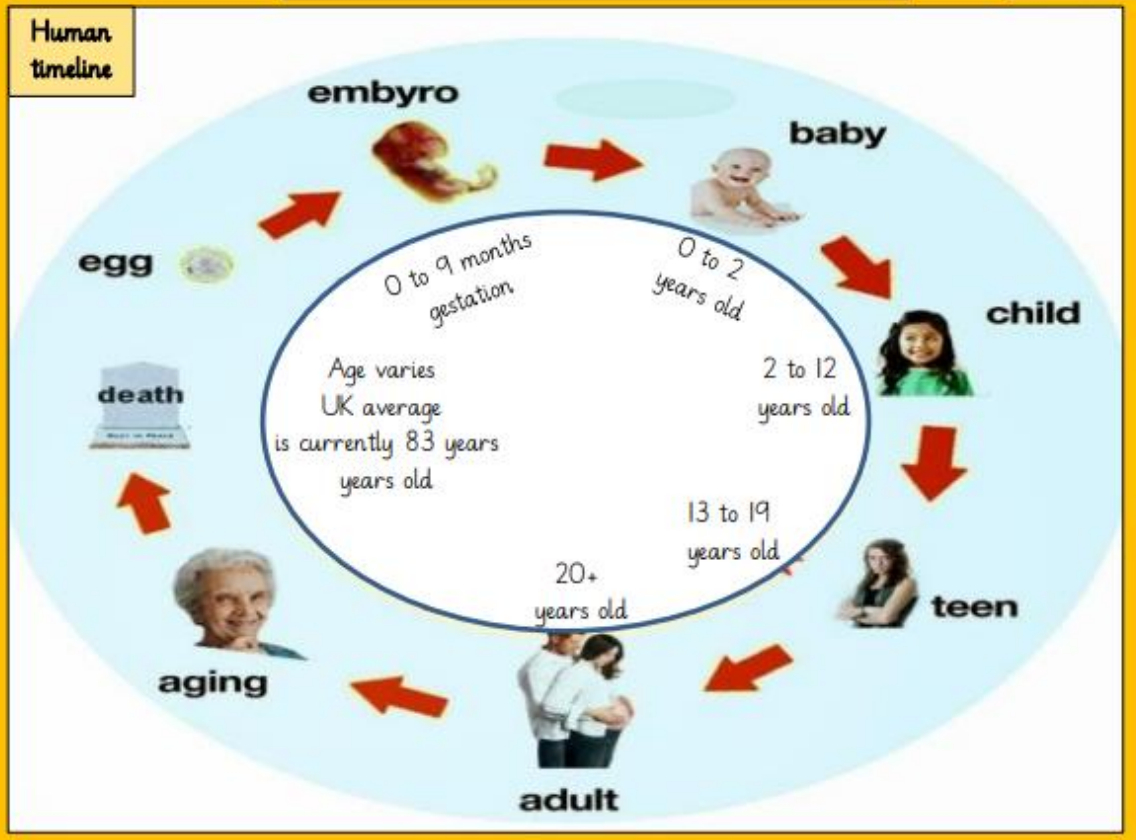
Science

Animals Including Humans

Key Vocabulary and Phrases	
Puberty	Puberty is the time when a boy or girl's body begins to develop and change as they become an adult.
Gestation	The process and time period of developing inside the womb before birth

Gestation Times vary between animals	
Human	9 months
Cat (domestic)	62 days
Cow	280 days
Chimpanzee	237 days
African elephant	640 days

Human timeline



Changes as humans grow to old age

Baby
Babies bodies grow and they develop their use of their senses; their movement and by approximately 12 months old begin to walk. This is also a time when they are learning to eat and speak so talking to a baby properly is extremely important as they learning from the older children and adults around them.

Child
A child's body continues to grow, becoming much stronger in their movements, such as running and riding a bike. They will now be eating a range of foods to keep them healthy and grow strong

Teen
This is a time in a human's life when puberty takes place. Puberty is the time when a boy or girl's body begins to develop and change as they become an adult. Boys develop a deeper voice and start to grow hair on their body. Girls develop breasts and start their periods. The average age for girls to begin puberty is 11 years old, while for boys the average age is 12

Adult
By the time a human reaches adulthood, they are fully grown and developed. As adults get older their movement begin to slow down, maybe get grey hair and wrinkles.

School Nurses will support Year 5 to learn more about puberty

Year 6 — Science

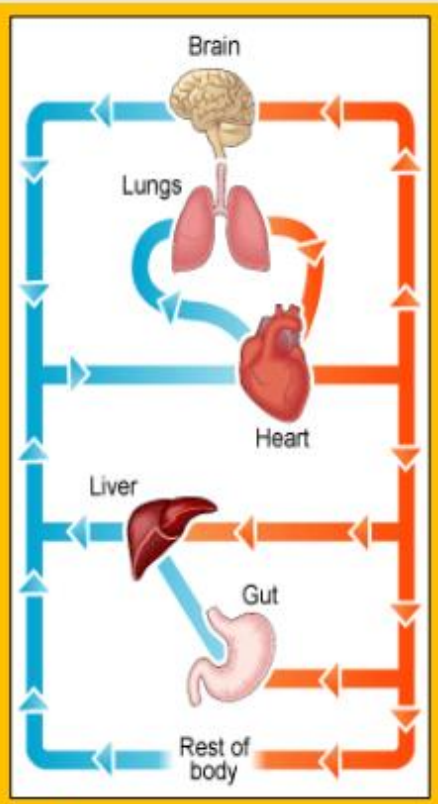
Animals Including Humans

The Circulatory System

The main parts of the circulatory system	heart, blood vessels, lungs
What does the heart do?	The heart pumps the blood through the blood vessels so that food and oxygen can get to all the parts of the body.
What do the blood vessels do?	The blood vessels carry blood around the body.
Three main blood vessels	**Arteries** carry blood away from the heart. **Capillaries** enable the actual exchange of energy between the blood and the tissues. **Veins** carry blood towards the heart.
What does the blood do in humans and animals?	Blood transports the necessary nutrients from food and oxygen around the body
What do the lungs do?	The lungs give the blood oxygen to take around the body. When the blood enters the lungs the alveoli (air sacs) give oxygen to the blood and then they get rid of the carbon dioxide.

Key Vocabulary and Phrases

Oxygenated blood	Oxygenated blood comes out the left side of the heart ready to deliver it around the body.
Deoxygenated blood	Blood that has no oxygen in it enters the right side of the heart and is the pumped to the lungs to re-oxygenate.

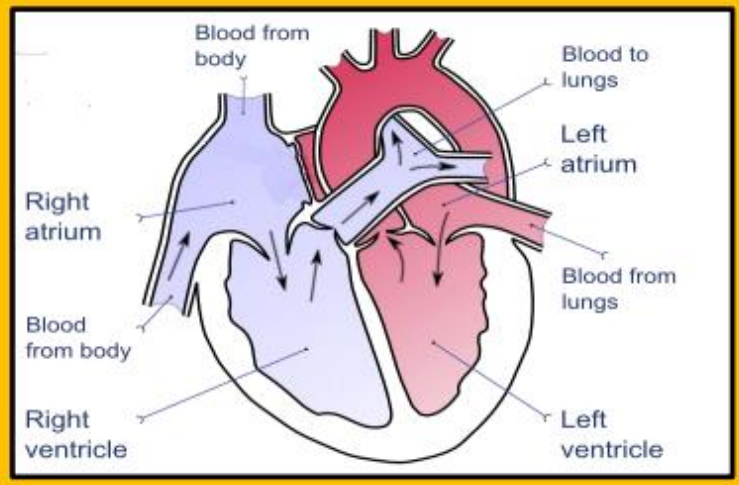


Key Vocabulary and Phrases

oxygen	an element found in air
circulatory	to travel in a circle or circuit
system	the process in which something is done in an organised way

Healthy Lifestyle

Things humans need to be healthy	To have a balanced diet of the right amount of different types of food and drink To exercise regularly To have a healthy diet To be hygienic To have the right amount of rest To have a healthy lifestyle
Health risks that can damage the body	Smoking, drugs, alcohol, obesity
Dangers of smoking	Addictive Can cause heart disease and cancer
Dangers of drugs	Addictive Can damage the brain or cause death
Dangers of alcohol	Ok in small amounts for adults Can damage the liver, heart and stomach
Dangers of obesity	Can cause heart disease Can lead to cancer



Year 6

Science

Working Scientifically – Animals Including Humans

Key Vocabulary and Phrases	
Ask questions	Use the question words **What, where, when why, how**
Compare and contrast	Look at two or more results and describe similarities and differences and discuss the reasons for these.
Observe and explain	Be able to observe changes and explain the reasons for these using scientific vocabulary
Prediction	Predict the how the different exercises will effect the heart rate.
Record data	Drawings, scientific diagrams, photos, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out. Measuring heart rate and weight.
Reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy. A scientific explanation of my findings and conclusions.

What I could investigate or research

How does exercise impact the heart?
Which different types of exercise increase pulse rate and why?

How quickly does your pulse rate return to resting?

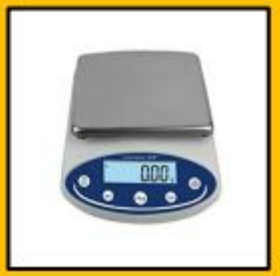
Can you explore the recovery rate for different types of people?

How much sugar is there in a can of fizzy pop?
How much sugar is included in the fizzy beverages we drink and how does this count as part of our daily calories and impact on a healthy diet?

Equipment I could use

Water Tank used to measure weight of sugar in fizzy drinks

Weighing scales to weigh the sugar and compare amounts



Stop watch to measure amount of time spent on exercise

Paper, pen, pencil and photographs to observe and record what I find out.

How I could record my findings

Pictures
For EXPLORING

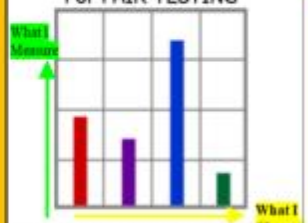
Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Table
For FAIR TESTING/PATTERN SEEKING

What I Change	What I measure

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

Bar Chart
For FAIR TESTING



Use this if you have only 1 set of numerical (continuous) data and the other is words, e.g. type of material and volume of water it can hold

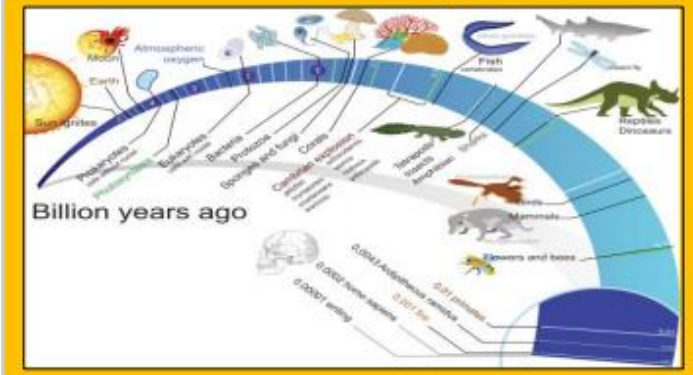
Year 6

Science

Evolution and Inheritance

Charles Darwin:

Charles Darwin developed the theory of Evolution after his voyage around the world. He published 'On the origin of species' in 1859.



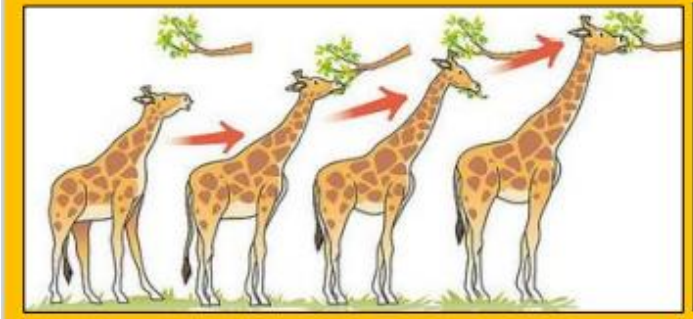
Parents and Offspring

Living things produce offspring of the same kind. Characteristics are passed from parents to their offspring


Labrador


Poodle


Labradoodle

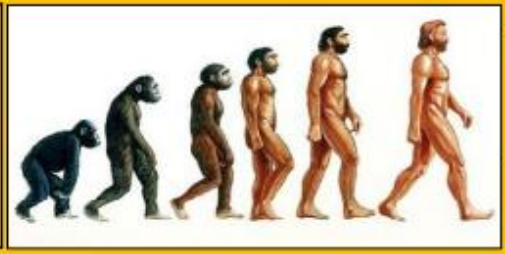


Evolution of Giraffes

The theory on giraffe evolution is that the giraffes with the longest necks passed on their genes through natural selection, and that it took millions of years to get the animal we see now. The two forces that drove giraffes towards elongating their necks are simple - the need to eat and the need to breed.

Evolution of humans

Human evolution is the lengthy process of change by which people originated from apelike ancestors. Scientific evidence shows that the physical and behavioural traits shared by all people originated from apelike ancestors and evolved over a period of approximately six million years. Humans are primates



Key Vocabulary and Phrases

Adaptation	The process of change so that an organism or species can become better suited to their environment
Breeding	The mating and production of offspring by animals
Environment	The surroundings or conditions in which a person, animal, or plant lives
Fossil	The remains or impression of a prehistoric plant or animal embedded in rock and preserved
Inherit	To gain a quality, characteristic or predisposition genetically from a parent or ancestor
Offspring	A person's child or children/ an animal's young
Parent	A biological parent is one that passes their physical characteristics to their offspring
Reproduction	The production of offspring by a sexual or asexual process
Evolution	The process by which living things can gradually change over time.
Endangered	A species seriously at risk of extinction.
Extinct	If an organism is not suited to its environment, then it will die out and no longer exist.,
Natural Selection	Natural selection means that some individuals in a species are better at surviving than others and will have more children.
'Survival of the fittest'	When only animals that are suited to their environment will continue to live and reproduce.

Year 6

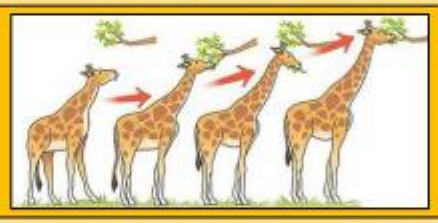
Science

Working Scientifically – Evolution and Inheritance

Key Vocabulary and Phrases	
Ask questions	Use the question words **What, where, when why, how**
Compare and contrast	Look at two or more organism and describe similarities and differences and how they are adapted to their environment.
Classify, sort and group	Organise objects by their characteristics and adaptations (e.g. colour, size, shape).
Diagram	A labelled picture of species and their adaptations.
Record data	Drawings, scientific diagrams, photos, branching key, tables and line graphs to show population decrease.
Reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

What I could investigate or research

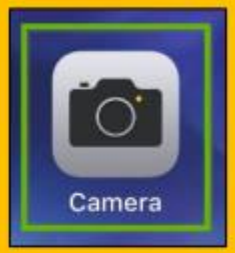
How have different living organisms adapted to their environment over time and what are advantages and disadvantages of these adaptations?



Explain and investigate why the Galapagos finches have different types of beaks and how this enabled them to survive?

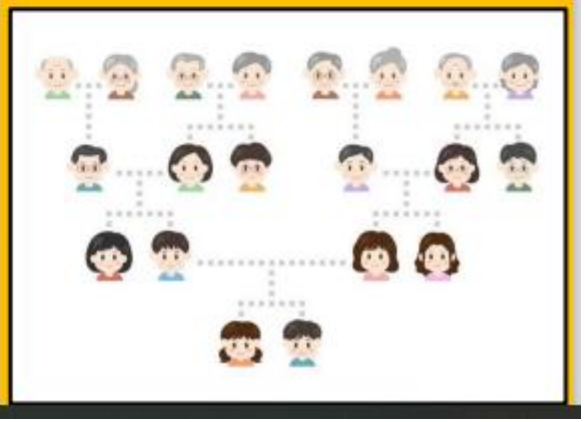
Equipment I could use

A range of photographs and videos to examine and analyse



Pick an endangered animal Why are they on this list? Why are they not able to adapt to their environment?

What do offspring inherit from their parents?



How I could record my findings

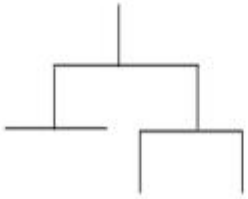
Pictures
For EXPLORING

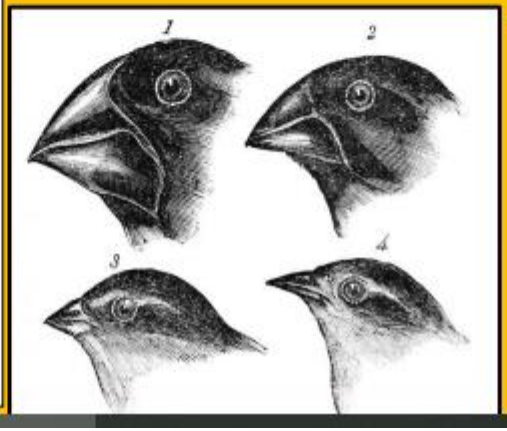
Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Line Graph
For FAIR TESTING

Use this if you have continuous (numerical) data for both axes e.g. mass on an elastic band & how long it is or are measuring over time

Branching Key
For CLASSIFYING AND IDENTIFYING





Year 1

Science

Plants

Deciduous trees lose their leaves in the autumn every year. Their leaves are generally broad, flat and have veins running through them.

Evergreen trees have green leaves all year round. Their leaves are generally thick and waxy or have narrow like needles.

Fruit and vegetables are also types of plants.

Common garden flowers are chosen by people to grow and look after.

rose

poppy

sunflower

A wild plant will grow by itself. It does not need to be cared for. If it grows somewhere unwanted, it may be a weed.

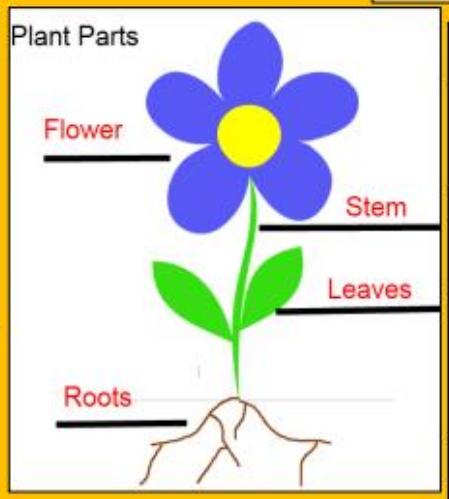
clover

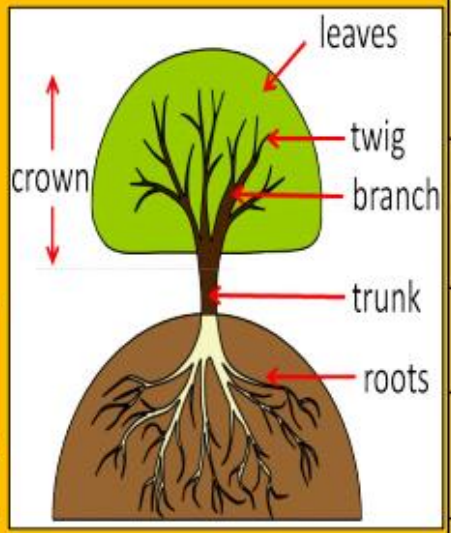
dandelion

daisy

buttercup

nettle





Key Vocabulary and Phrases	
Deciduous	a tree that loses its leaves in the autumn every year
Evergreen	a tree or bush which has green leaves all the year round
Plant	a living thing that grows in the earth and has a stem, leaves, and roots
Roots	the parts of a plant that grow under the ground
Leaf	the parts of a tree or plant that are flat, thin, and usually green
Stem	the thin, upright part of a plant on which the flowers and leaves grow
bulb	a root shaped like an onion that grows into a flower or plant
petal	thin coloured or white parts which form part of the flower
tree	a tall plant that has a hard trunk, branches, and leaves
branches	parts that grow out from the tree trunk and have leaves, flowers, or fruit growing on them

Year 1

Science

Working Scientifically - Plants

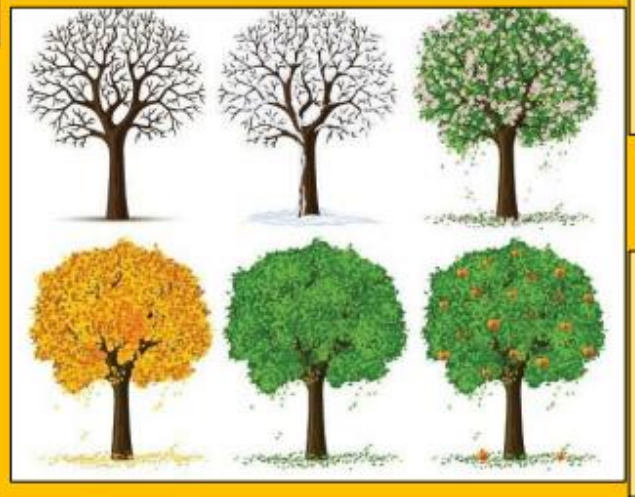
Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
observe closely	Use senses to watch what happens
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
sort and group	Organise plants by their features (e.g. colour, size, shape).
observe changes over time	Observe the growth of plants and vegetables.
diagram	A labelled picture
record	Drawings, diagrams, photos, writing and numbers to show what I have found out.

What I could investigate

Do all plants have flowers?



How do plants change?



Equipment I could use

Magnifying glasses for observing closely

Sorting rings to sort and group objects

Egg timers to observe changes over time

Camera, pencil and paper to record what I find out.

How I could record my findings

Pictures
For EXPLORING

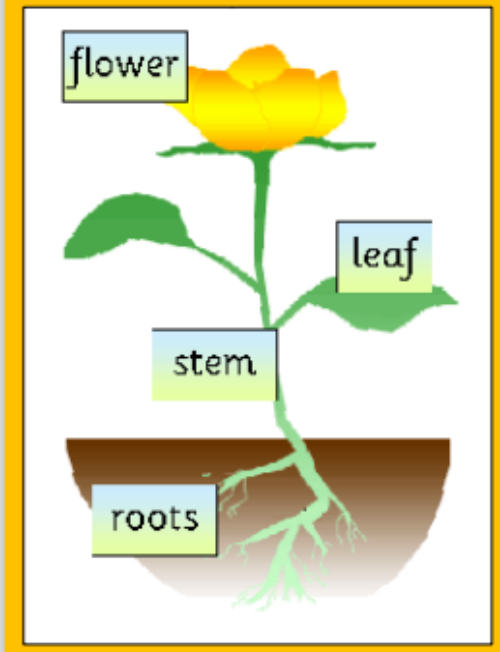
Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

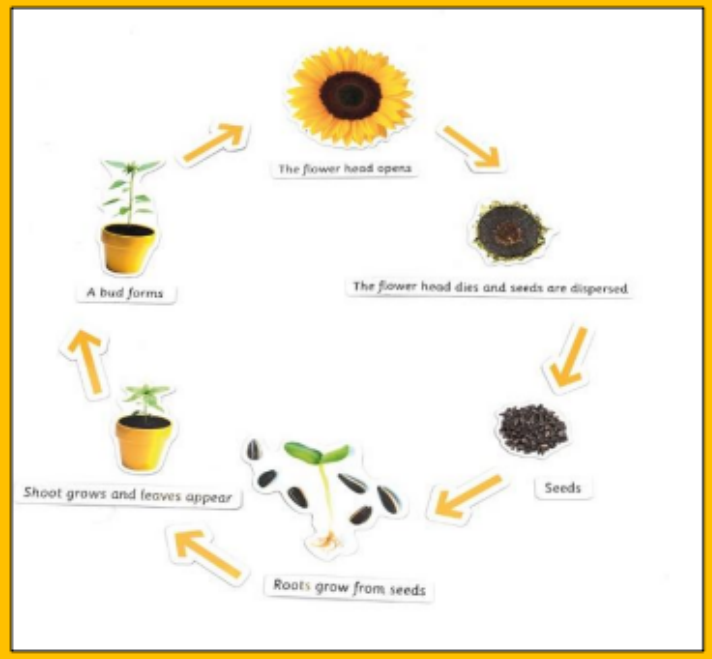
Year 2

Science

Plants

What We Need to Know	
Parts of a plant and their functions	Flower or petals: These are brightly coloured to attract insects. Leaves: They provide food and air to help the plant to grow. Stem: It carries water and minerals to the leaves. Roots: They take water and nutrients from the soil.
How do plants grow and survive?	Plants need water, warmth, air and sunlight for healthy growth.





Seeds and bulbs have a store of food inside of them.

Key Vocabulary and Phrases	
Leaf	provides food and air to the plant
flower	brightly coloured part of the flower
stem	carries water and minerals
roots	takes water and nutrients from the soil
blossom	a mass of flowers
bud	a growth on the plant that grows into a flower, leaf or shoot
bulb	an underground bud or stem of a seed
seeds	reproduction of a flowering plant
mature	a point of growth where you can see flowers
temperature	how hot something is
light	produces food for a plant
water	feeds a plant to help it grow
nutrients	a substance that is needed for healthy growth
soil	used to plant seeds and bulbs
germination	seeds begin to sprout

Year 2

Science

Working Scientifically – Plants

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
variable	Something that you are able to change or adapt for example, temperature, position
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
sort and group	Organise plants by their features (e.g. colour, size, shape).
observe and describe changes over time	Observe closely the changes of on object (in this case seeds and the growth of plants), and describe the similarities and differences from the start time to the end time.
measure	length using centimetres, mass using grams volume using millilitres Time using second, minutes and hours
diagram	A labelled picture
record	Drawings, diagrams, photos, charts and tables, writing and numbers to show what I have found out.

How I could record my findings

Table
For FAIR TESTING/PATTERN SEEKING

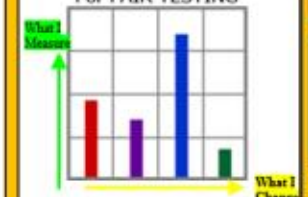
What I Change (Height of slope)	What I measure (Distance travelled)

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Bar Chart
For FAIR TESTING



Use this if you have only 1 set of numerical (continuous) data and the other is words, e.g. type of material and volume of water it can hold

What I could investigate

Do plants need light to grow?

Do plants need water to grow?

Do plants need warmth to grow?

Think about how you could change the one variable.

Equipment I could use

Magnifying glasses for observing closely

A ruler to measure the height of plants

A diary and calendar to record changes over time

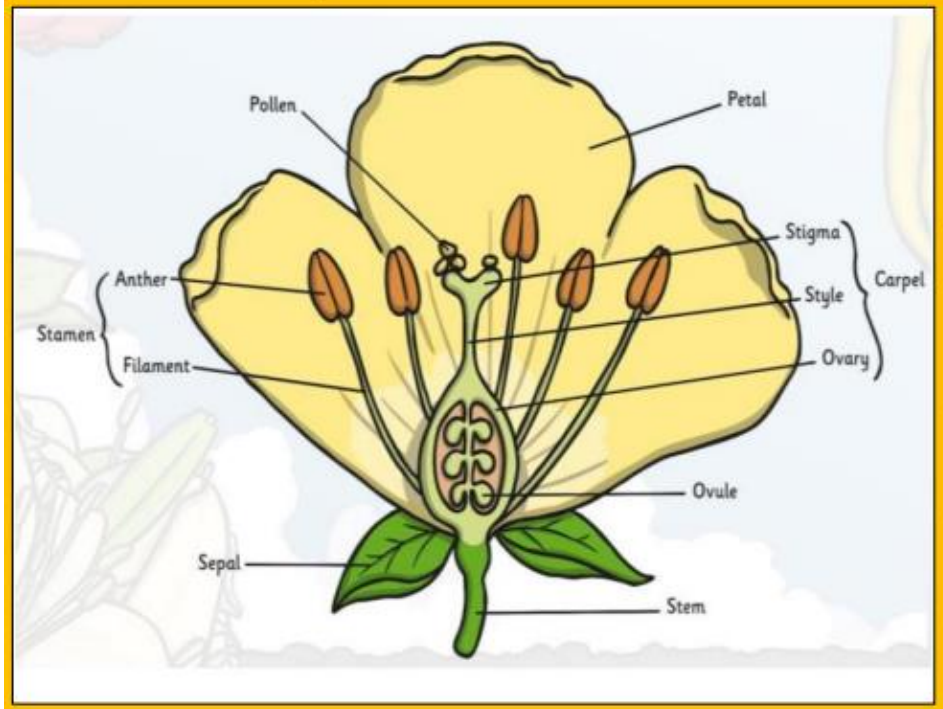
Camera, pencil and paper to record what I find out.

Year 3

Science

Plants

What We Need to Know	
Functions of the main parts of a plant	Flowers: They have colour and smell to attract insects. Leaves: They change carbon dioxide and water into food for the plant and oxygen. Stem: Hold the plant up and carry water from the roots. Trunk: The main woody stem of a tree Roots: Hold the plant in the ground and soak up water and minerals.
How plants grow and survive	Plants need light, water, air and nutrients from soil to survive. They also need room to grow which varies from plan to plant.
Parts of a flower	• Petal • Sepal • Carpel • Pollen • Stamen • Stem • Ovule



Key Vocabulary and Phrases	
Petal	The colourful part at the end of a stem
Stamen	The male part of a flower containing pollen
Carpel	The female part of a flower containing pollen
Fertilisation	When pollen and egg join together to make a seed
Seed Dispersal	Spreading seeds over a wide area
Seed Formation	The way the seed develops and takes shape
Pollen	A powdery yellow substance from the male part of a flower
Pollination	The transfer of pollen to the plant to allow fertilisation.
Nectar	A sweet liquid in flowers that attracts insects

How do seeds disperse?	
birds	Birds eat seeds but they do not digest then proper so they drop them out in their poo
wind	Some seeds are light enough to be carried in the wind
water	Some seed travel along rivers and water courses.
explosion	Some seeds burst out of there pods.

How does pollen get from one plant to another?	
Insects	The insect goes to the first flower looking for nectar. Pollen gets stuck to it, when it goes to another flower the pollen gets stuck to that flower.
Wind	Pollen is blown from one flower to another.

Year 3

Science

Working Scientifically – Plants

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
variable	Something that you are able to change or adapt for example, temperature, position, size
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
sort and group	Organise plants by their features (e.g. colour, size, shape).
observe and describe changes over time	Observe closely the changes of on object (in this case seeds and the growth of plants), and describe the similarities and differences from the start time to the end time.
measure	length using centimetres, mass using grams volume using millilitres Time using second, minutes and hours
diagram	A labelled picture
record	Drawings, diagrams, photos, charts and tables, writing and numbers to show what I have found out.

What I could investigate

Do plants need room to grow?

How does water transport within plants?

Equipment I could use

Magnifying glasses for observing closely

Sorting ring to sort seeds

How do seeds disperse?

A diary and calendar to record changes over time

Camera, pencil and paper to record what I find out.

How I could record my findings

Table
For FAIR TESTING/PATTERN SEEKING

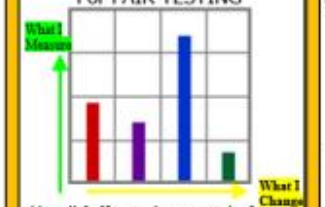
What I Change (Height of slope)	What I measure (Distance travelled)

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Bar Chart
For FAIR TESTING



Use this if you have only 1 set of numerical (continuous) data and the other is words, e.g. type of material and volume of water it can hold

Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

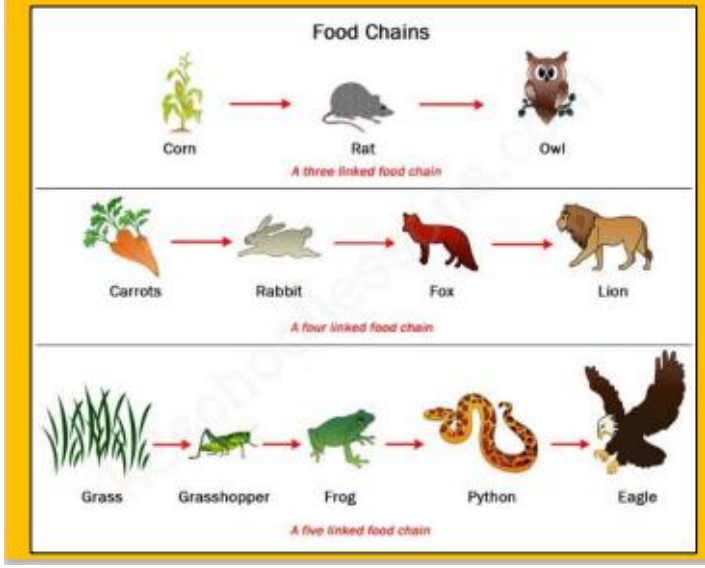
Think about how you could change the one variable.

Year 2

Science

Living Things and Their Habitats

What?	
What is a habitat?	A habitat is a place where living things, such as animals and plants, can find all of the things they need to survive. This includes food, water, air, space to move and grow and some shelter. Some habitats are large, like the ocean, and some are very small, such as under a log. Some habitats in our local area include the river and woodlands. Other habitats include the coast and the forest. Microhabitats are very small habitats where mini beasts may live.
How do plants and animals depend on each other?	Animals and plants depend on each other to survive. For example, worms depend on plants because they feed on dead leaves, but plants depend on worms who make the soil healthy by digging holes and allowing air in. All living things (or things that were once living) have a part to play in food chains. Without them, other animals and plants may not be able to survive.



Key Vocabulary and Phrases	
biomes	a natural area of vegetation and animals
carnivore	an animal that eats meat
depend	If you depend on someone or something, you need them in order to be able to survive physically
food chain	a series of living things which are linked to each other because each thing feeds on the one next to it in the series
habitat	the natural environment in which an animal or plant normally lives or grows
herbivore	an animal that only eats plants
microhabitat	a small part of the environment that supports a habitat, such as a fallen log in a forest
mini beast	a small invertebrate animal such as an insect or spider
omnivore	person or animal eats all kinds of food, including both meat and plants
source	where something comes from

Year 2 Science

Working Scientifically – Living Things and Their Habitats

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record	Drawings, diagrams, photos, charts and tables, writing and numbers to show what I have found out.

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

What I could investigate

Is a flame alive?

Is a deciduous tree dead in the winter?

How are the plants and animals different in a woodland from those in a rainforest or ocean? Why?

How are camels suited to living in hot, sandy deserts?

Why are polar bears white?

What is different about the living things found under logs to a stony path? Why?

Equipment I could use

Magnifying glasses for observing closely

Sorting ring to sort and classify e.g. alive, dead, never alive

Forest school and school grounds

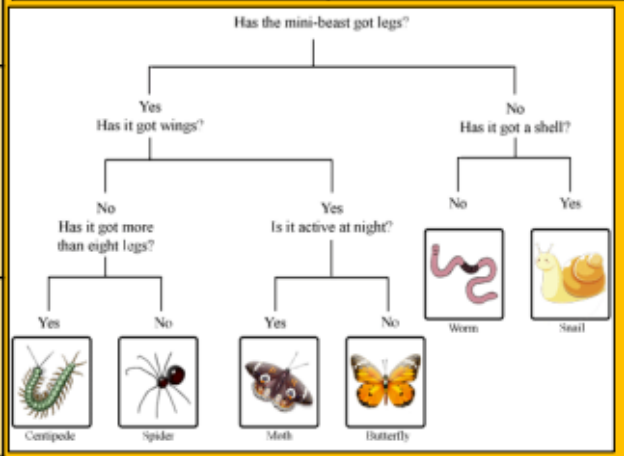
Camera, pencil and paper to record what I find out.

Year 4 — Science — Living Things and Their Habitats

Vertebrates		Living thing in the local and wider environment
Vertebrates	Are animals with a backbone	
There are 5 ways vertebrates can be grouped	Mammals , Fish, Birds, Reptiles, Amphibians	
Characteristics of mammals 	Breathes with lungs Babies are born live body hair or fur steady body temperature feeds babies milk	dog, cat, hamster fox hedgehog, badger
Characteristics of a fish 	Breathes with gills Lays eggs in water Has fins and scales Its body temperature changes	goldfish, stickleback, perch, tench, carp, pike,
Characteristics of birds 	Breathes with lungs Lays eggs with hard shells Has feathers Steady body temperature	canary, budgerigar, sparrow, blue-tit, magpie, pigeon
Characteristics of reptiles 	Breathes with lungs Lays eggs on land dry scaly skin body temperature changes	adder, grass snake common lizard
Characteristics of amphibians 	Born with gills then develops lungs Lays eggs in water Damp skin Body temperature changes	frog, toad, smooth newt great crested newt,

Invertebrates		Living things in the local and wider environment
Invertebrates	Are animals with no backbone	
There are 3 ways invertebrates can be grouped	Insects, Arachnids, Molluscs	Worms do not fit in any of the 3 groups
Characteristics of insects	3 body sections, 6 legs	Butterflies, bees, beetles
Characteristics of arachnids	2 boys sections, 8 legs	Spiders
Characteristics of a mollusc	Slimy foot, often has a shell	Slugs and snails

Habitats	
What is a habitat?	Where a plant or animals lives.
How can habitats change?	The seasons can change habitats with the weather and plant life in the habitat changing. Humans can change habitats, for example by dropping litter or chopping down trees.



Classification Key

Venn diagram

M - Movement
R - Respiration
S - Sensitivity

G – Growth
E - Excretion
R - Reproduction
N - Nutrition

Plants in the local environment	
Flowering plants	grasses, cereals, garden shrubs, deciduous trees
Non-flowering plants	algae, moss, fern, coniferous (evergreen) trees

Key Vocabulary	
Gills	Slits on the side of a fish to help it breathe.
Fins	Part of a fish that helps it move and balance.
Scales	Thin plates protecting the skin of fish or reptiles.
Lung	Spongy bags in the chest used when breathing
Body Temperature	How hot or cold the inside of an animals body is.
Section	A part of something
Deciduous	A tree that loses its leaves in Autumn and grows new ones in Spring
Coniferous (Evergreen)	A plant or tree that keeps its leaves all year.
Algae	A small plant that is found in water. It has no stems, roots or leave

Year 4 — Science

Working Scientifically – Living Things and Their Habitats

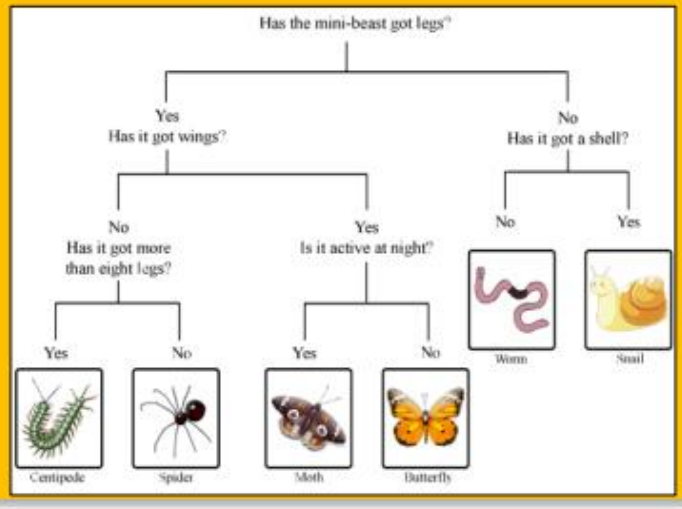
Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record	Drawings, diagrams, photos, charts and tables, writing and numbers to show what I have found out.

What I could investigate

What impact have humans had on our local environment?

Observe animal activity
What conditions do woodlice prefer? How do you know this?

Use simple classification keys to identify local plants and animals



Equipment I could use

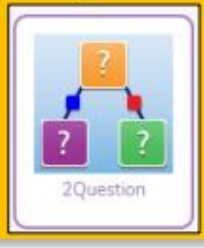
Magnifying glasses for observing closely

Sorting ring to sort, group and classify e.g. flowering and non-flowering plants

Forest school, school grounds and local area – park, Fens Pool

Camera, pencil and paper to record what I find out.

Branching databases in Computing



How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Tally Chart
For SURVEYING

Animals	Pictures
birds	
rabbits	

Use this to count the number of objects or to carry out a survey, e.g. which children have had mumps, chicken pox, flu or measles.

Pictogram
Similar, but uses pictures instead of tallies

Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

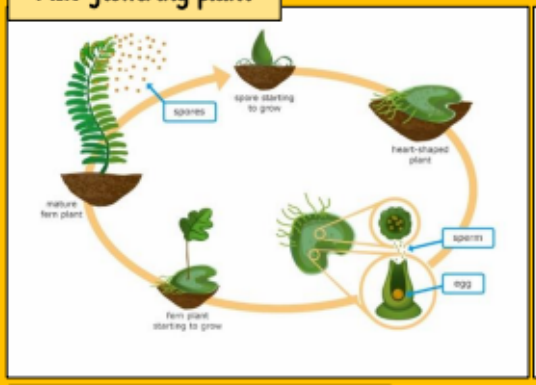
Year 5

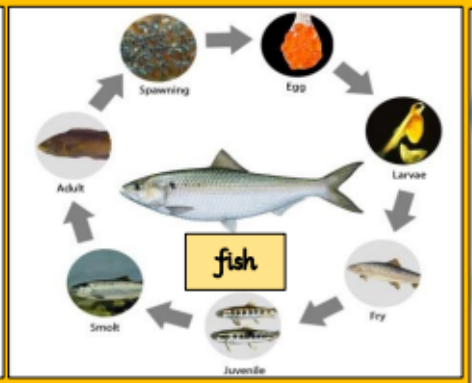
Science

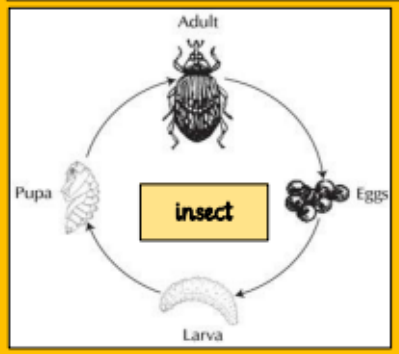
Living Things and Their Habitats

Key Vocabulary and Phrases	
Prey	An animal that is hunted and killed by another for food.
Secondary consumers	Secondary consumers are organisms that eat primary consumers for energy.
Tertiary consumers	A tertiary consumer is an animal that obtains its nutrition by eating primary consumers and secondary consumers.
Habitat	The natural home or environment of an animal, plant, or other organism.
Womb	The organ in the lower body of a woman or female mammal where offspring are conceived and carried.
Nutrition	The process of providing or obtaining the food necessary for health and growth.
Monotremes	A mammal that lays large yolky eggs.
Microhabitat	A smaller habitat inside of a larger habitat.
Invertebrate	An animal that does not have a backbone.
Climate	The weather conditions in a certain area.
Ecosystem	A community of interacting organisms.
Metamorphosis	The process of transformation from an immature form to an adult in an insect or amphibian.
Organism	An individual animal, plant, or single-celled life form.
Decomposers	An organism that decomposes organic material.
Producers	Producers are organisms who make or produce their own food.
Consumers	A person or thing that eats or uses something.
Predator	An animal that naturally preys on others.

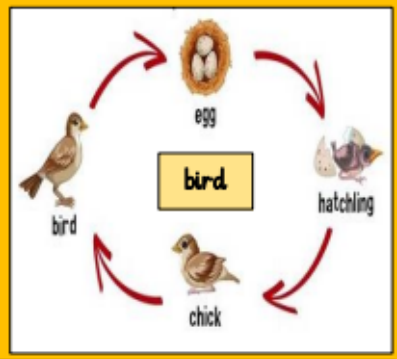
Non-flowering plant

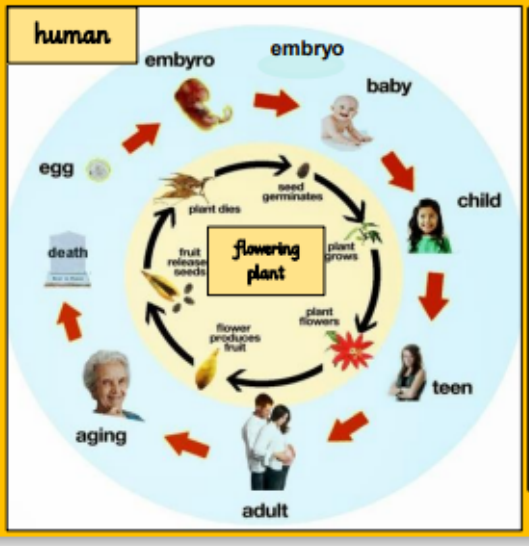


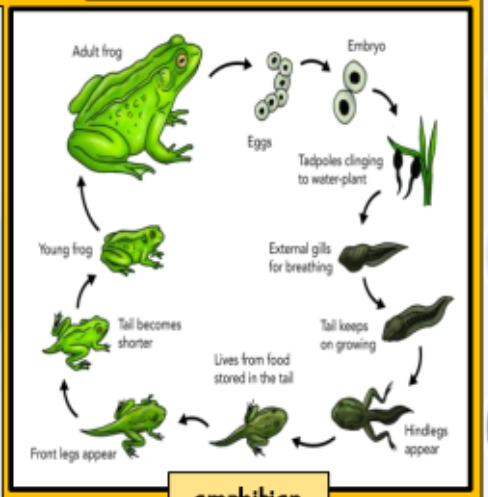




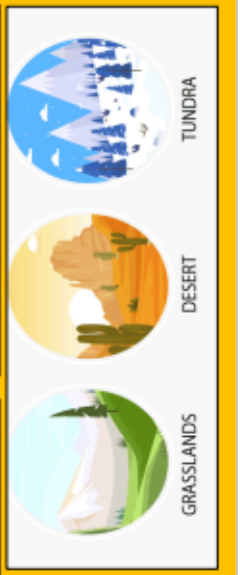
Life cycles

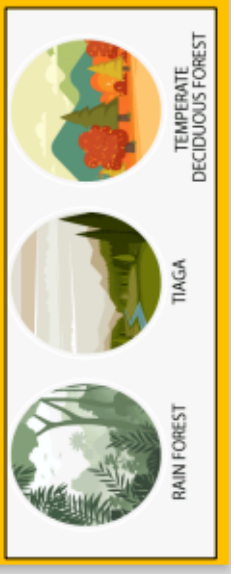






Habitats





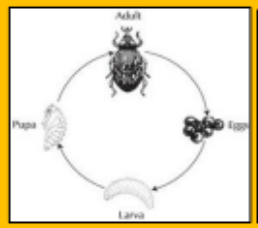
Year 5 — Science

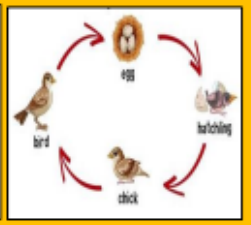
Working Scientifically – Living Things and Their Habitats

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

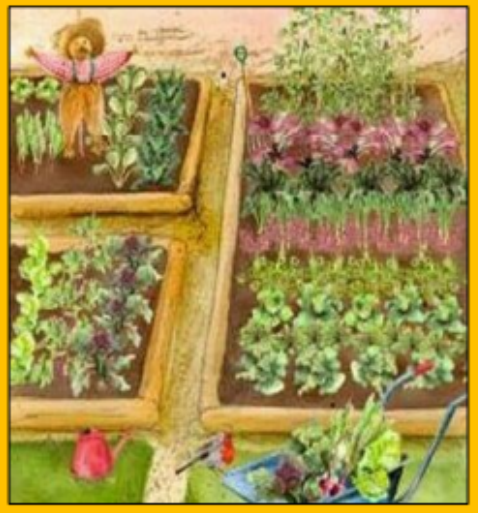
What I could investigate

Compare life-cycles of animals around the world, suggesting similarities and differences





Observe life-cycle changes in a variety of animals and plants including vegetables



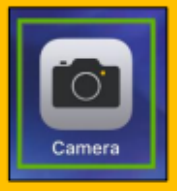
Equipment I could use

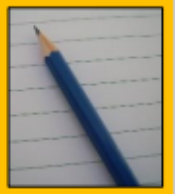
Magnifying glasses for observing closely

School garden

Forest school, school grounds and local area – park, Fens Pool

Camera, pencil and paper to record what I find out.





How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Line Graph
For FAIR TESTING

Use this if you have continuous (numerical) data for both axes e.g. mass on an elastic band & how long it is or are measuring over time

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers

Year 6

Science

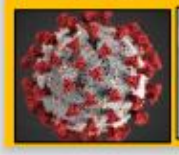
Living Things and Their Habitats

Vertebrates

Vertebrates	Are animals with a backbone
There are 5 ways vertebrates can be grouped	Mammals , Fish, Birds, Reptiles, Amphibians
Characteristics of mammals  	Breathes with lungs Babies are born live body hair or fur steady body temperature feeds babies milk
Characteristics of a fish 	Breathes with gills Lays eggs in water Has fins and scales Its body temperature changes
Characteristics of birds 	Breathes with lungs Lays eggs with hard shells Has feathers Steady body temperature
Characteristics of reptiles 	Breathes with lungs Lays eggs on land dry scaly skin body temperature changes
Characteristics of amphibians 	Born with gills then develops lungs Lays eggs in water Damp skin Body temperature changes

Microbiology

Is the study of the smallest living things. These cannot be seen by the naked eye and you will need a microscope to see them. There are bacteria, virus' and fungi.




Invertebrates

Invertebrates	Are animals with no backbone
There are 3 ways invertebrates can be grouped	Insects, Arachnids, Molluscs
Characteristics of insects 	3 body sections 6 legs
Characteristics of arachnids 	2 boys sections 8 legs
Characteristics of a mollusc 	Slimy foot Often has a shell

Key Vocabulary

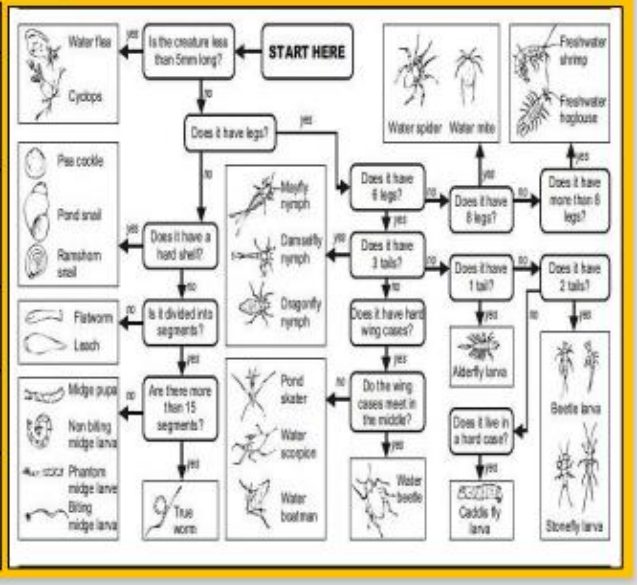
Taxonomy	The part of science focused on classification
Classification	Grouping something using its features.
Distinguish	Recognise a difference

Five Kingdoms

Animal	Eat food, have a nervous system, can be split into vertebrates and invertebrates.
Plant	Convert sunlight into food, help produce oxygen, some produce flowers or fruit.
Fungi	Take their energy from dead plants and animals, They are motionless.
Protista	Single-celled organism. Often live in water.
Prokaryotes (bacteria)	Simple structures, smallest living things on earth. Can be helpful or harmful

Distinguishing Living Things

Key features to distinguish between animals	Invertebrate or Vertebrate Mammal, Reptile, Fish, Amphibian, Bird Colour Length Number of legs Number of body segments Distinguishing features Habitat
Key features to distinguish between plants	Flowering or Non-Flowering Grass, cereal, garden shrub, deciduous, algae, coniferous, fern Colour Height Number of flowers Fruit bearing or not Distinguishing features Usual location



Year 6 | Science | Working Scientifically - Living Things and Their Habitats

Woodside Primary School

Key Vocabulary and Phrases

ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
classify, sort and group	Organise objects by their features (e.g. colour, size, shape).
diagram	A labelled picture
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

What I could investigate and research

Give reasons why living things are place in one group and not another

Use classification systems and keys to identify some animals and plant sin the immediate environment.

Research unfamiliar plants and animals from a broad range of other habitats and decide where they belong in the classification key

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed, e.g. bread going mouldy

Tally Chart
For SURVEYING

Animals	Pictures
birds	
rabbits	

Use this to count the number of objects or to carry out a survey, e.g. which children have had mumps, chicken pox, flu or measles.

Pictogram
Similar, but uses pictures instead of tallies

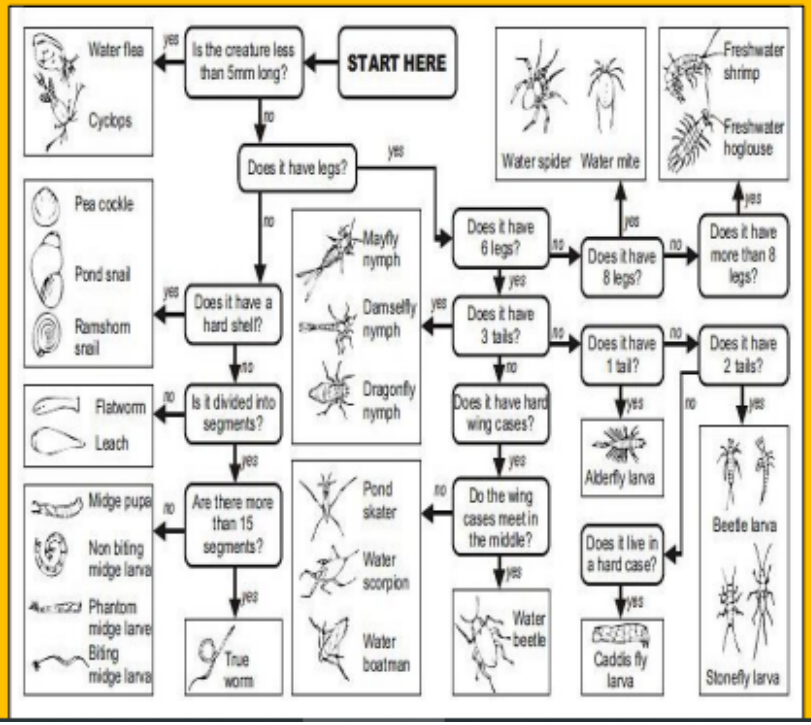
Venn Diagram
For CLASSIFYING/GROUPING

Use this to show how objects are grouped together and any that could be in either group. You can use more than 2 circles or groups, e.g. animals that live on land or on water, with those that do both in the middle

Carroll Diagram
For CLASSIFYING/GROUPING

	Red	Blue
Square		
Triangle		

Use this when you want to put objects into categories for having a property or not, e.g. prime/not prime numbers against even/not even (odd) numbers



Equipment I could use

Forest school, school grounds and local area – park, Fens Pool

Camera, pencil and paper to record what I find out.

Branching databases in Computing