



Science Curriculum Overview

All Saints CE Primary School
Whitefield, Bury

Key Knowledge: Year 1

Biology			Chemistry	Physics
Animals, including Humans	Animals, including Humans	Plants	Everyday Materials	Seasonal Change
- Name common animals - Carnivores, etc	Human body and senses	- Common plants - Plant structure	- Properties of materials - Grouping materials	- The four seasons - Seasonal weather
- Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds - Know and classify animals by what they eat (carnivore, herbivore and omnivore) - Know how to sort by living and non living things	- Know the name of parts of the human body that can be seen - Know about the five senses.	- Know and name a variety of common wild and garden plants - Know and name the petals, stem, leaves and root of a plant - Know and name the roots, trunk, branches and leaves of a tree	- Know the name of the materials an object is made from - Know about the properties of everyday materials	Name the seasons and know about the type of weather in each season

Key Knowledge: Year 2

Biology			Chemistry	
All living things and their habitats	Animals, including Humans	Plants	Everyday Materials	
• <i>Alive or dead</i> • <i>Habitats</i> • <i>Adaptations</i> • <i>Food chains</i>	• <i>Animal reproduction</i> • <i>Healthy living</i> • <i>Basic needs</i>	• <i>Plant and seed growth</i> • <i>Plant reproduction</i> • <i>Keeping plants healthy</i>	• <i>Identify different materials</i> • <i>Name everyday materials</i> • <i>Properties of materials</i>	• <i>Compare the use of different materials</i> • <i>Compare movement on different surfaces</i>
• Classify things by living, dead or never lived • Know how a specific habitat provides for the basic needs of things living there (plants and animals) • Match living things to their habitat • Name some different sources of food for animals • Know about and explain a simple food chain	• Know the basic stages in a life cycle for animals, (including humans) • Know why exercise, a balanced diet and good hygiene are important for humans	• Know and explain how seeds and bulbs grow into plants • Know what plants need in order to grow and stay healthy (water, light & suitable temperature)	• Know how materials can be changed by squashing, bending, twisting and stretching	• Know why a material might or might not be used for a specific job

Key Knowledge: Year 3

Key Knowledge: Year 3					
Biology			Chemistry	Physics	
Animals, including humans	Plants	Plants	Rocks	Forces	Light
<i>Skeleton and muscles</i> <i>Nutrition</i> <i>Exercise and health</i>	<i>Plant life</i> <i>Basic structure and functions</i>	<i>Life cycle</i> <i>Water transportation</i>	<i>Fossil formation</i> <i>Compare and group rocks</i> <i>Soil</i>	<i>Different Forces</i> <i>Magnets</i>	<i>Reflections</i> <i>Shadows</i>
- Know about the importance of a nutritious, balanced diet - Know how nutrients, water and oxygen are transported within animals and humans - Know about the skeletal and muscular system of a human	Know the function of different parts of flowering plants and trees	- Know how water is transported within plants - Know the plant life cycle, especially the importance of flowers	- Compare and group rocks based on their appearance and physical properties, giving reasons - Know how soil is made and how fossils are formed - Know about and explain the difference between sedimentary, metamorphic and igneous rock	- Know about and describe how objects move on different surfaces - Know how a simple pulley works and use to on to lift an object - Know how some forces require contact and some do not, giving examples - Know about and explain how magnets attract and repel Predict whether magnets will attract or repel and give a reason	- Know that dark is the absence of light - Know that light is needed in order to see and is reflected from a surface - Know and demonstrate how a shadow is formed and explain how a shadow changes shape - Know about the danger of direct sunlight and describe how to keep protected

Key Knowledge: Year 4

Biology		Chemistry	Physics	
Animals, including humans	All living things and their habitats	States of Matter	Electricity	Sound
- Digestive system - Teeth - Food chains	- Grouping living things - Classification keys - Adaptation of living things	- Compare and group materials - Solids, liquids and gases - Changing state - Water cycle	- Uses of electricity - Simple circuits and switches - Conductors and insulators	- How sounds are made - Sound vibrations - Pitch and Volume
- Identify and name the parts of the human digestive system - Know the functions of the organs in the human digestive system - Identify and know the different types of human teeth - Know the functions of different human teeth - Use and construct food chains to identify producers, predators and prey	- Use classification keys to group, identify and name living things - Know how changes to an environment could endanger living things - Group materials based on their state of matter (solid, liquid or gas)	- Know the temperature at which materials change state - Know about and explore how some materials can change state - Know the part played by evaporation and condensation in the water cycle	- Identify and name appliances that require electricity to function - Construct a series circuit - Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers) - Predict and test whether a lamp will light within a circuit - Know the function of a switch - Know the difference between a conductor and an insulator; giving examples of each	- Know how sound is made, associating some of them with vibrating - Know how sound travels from a source to our ears - Know the correlation between pitch and the object producing a sound - Know the correlation between the volume of a sound and the strength of the vibrations that produced it - Know what happens to a sound as it travels away from its source

Key Knowledge: Year 5

Biology		Chemistry	Physics	
All living things and their habitats	Animals, including humans	Properties and changes in materials	Forces	Earth and Space
- Life cycles – plants and animals - Reproductive processes - Famous naturalists	Changes as humans develop from birth to old age	- Compare properties of everyday materials - Soluble/ dissolving - Reversible and irreversible substances	- Gravity - Friction - Forces and motion of mechanical devices	- Movement of the Earth and the planets - Movement of the Moon - Night and day
- Know the life cycle of different living things e.g. mammal, amphibian, insect and bird - Know the differences between different life cycles - Know the process of reproduction in plants - Know the process of reproduction in animals	Create a timeline to indicate stages of growth in humans	- Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets - Know and explain how a material dissolves to form a solution - Know and show how to recover a substance from a solution - Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating) - Know and demonstrate that some changes are reversible and some are not - Know how some changes result in the formation of a new material and that this is usually irreversible	- Know what gravity is and its impact on our lives - Identify and know the effect of air and water resistance - Identify and know the effect of friction - Explain how levers, pulleys and gears allow a smaller force to have a greater effect	- Know about and explain the movement of the Earth and other planets relative to the Sun - Know about and explain the movement of the Moon relative to the Earth - Know and demonstrate how night and day are created - Describe the Sun, Earth and Moon (using the term spherical)

Key Knowledge: Year 6

Biology			Physics	
Animals, including humans	All living things and their habitats	Evolution and Inheritance	Electricity	Light
<i>The circulatory system</i> <i>Water transportation</i> <i>Impact of exercise on body</i>	<i>Classification of living things and the reasons for it</i>	<i>Identical and non identical off-spring</i> <i>Fossil evidence and evolution</i> <i>Adaptation and evolution</i>	<i>Electrical components</i> <i>Simple circuits</i> <i>Fuses and voltage</i>	<i>How light travels</i> <i>Reflection</i> <i>Ray models of light</i>
- Identify and name the main parts of the human circulatory system - Know the function of the heart, blood vessels and blood - Know the impact of diet, exercise, drugs and lifestyle on health - Know the ways in which nutrients and water are transported in animals, including humans	- Classify living things into broad groups according to observable characteristics and based on similarities and differences - Know how living things have been classified - Give reasons for classifying plants and animals in a specific way	- Know how the Earth and living things have changed over time - Know how fossils can be used to find out about the past - Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents) - Know how animals and plants are adapted to suit their environment - Link adaptation over time to evolution - Know about evolution and can explain what it is	- Compare and give reasons for why components work and do not work in a circuit - Draw circuit diagrams using correct symbols - Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer	- Know how light travels - Know and demonstrate how we see objects - Know why shadows have the same shape as the object that casts them - Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Working Scientifically Progression

Key Concepts	Variables	Something in an enquiry that can be changed or controlled.	Enquiry Types	Comparative and Fair Testing
	Validity	How accurate or correct the results of an enquiry are.		Pattern Seeking
	Design	How a scientific question was investigated		Grouping and Classifying
	Reporting	How the findings of an enquiry are communicated to others		Observations Over Time
				Research using Secondary Sources

Working Scientifically Progression

Years 1 & 2

Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science.

Variables	Validity	Design	Reporting
		Know that objects can be identified or sorted into groups based on their observable properties. Know that we can use magnifying glasses to observe objects closely. Know that we can test our questions to see if they are true.	Know that we can write down numbers and words or draw pictures to record what we find.

Working Scientifically Progression

Years 3 &4

Know that we can ask questions and answer them by setting up scientific enquiries
Know how to make relevant predictions that will be tested in a scientific enquiry

Variables	Validity	Design	Reporting
Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same.	Know that scientific enquiries can suggest relationships, but that they do <u>not</u> prove whether a prediction is true. Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even. Know that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry.	Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches. Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts. Know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry.	Know how to draw bar charts, a neat table and a classification key. Know how to label a diagram using lines to connect information to the diagram and how to use a coloured key. Know how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table. Know – with structured guidance - how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion. Know that they can draw conclusions from the findings of other scientists. Know how to shorten a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry.

Working Scientifically Progression

Years 5 & 6

- Know that we can ask questions and answer them by setting up scientific enquiries
- Know how to make relevant predictions that will be tested in a scientific enquiry

Variables	Validity	Design	Reporting
Know how to choose appropriate variables to test a hypothesis (e.g., plant height as a dependent variable when measuring effect of light on plant growth).	Know how to identify conditions that were imperfectly controlled and can explain how these might affect results. Know how to accurately use further measuring devices, including digital and analogue scales, measuring cylinders and beakers, recognizing the relative accuracy of each device. Know how to evaluate the validity of the data collected and suggest improvements for future enquiries.	Know how and when to repeat measurements, how to find an average of a set of measurements and how to recognize and remove outliers from a set of data, justifying the removal as a potential mis-measurement.	Know how to independently write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion. Know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary. Know examples of instances where scientific evidence has been used to support or refute ideas or arguments (e.g., fossil records as evidence of natural selection).

Opportunities to work scientifically

Year 1

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Seasonal Changes		Changes in temperature throughout the year			Length of daylight throughout the year
Animals, including humans			Research animals that live in a particular habitat	Group/ classify animals according to what they eat	Height changes as we get older
Plants		Changes to plants/ trees as they grow or in different seasons		Identify local trees and plants	
Everyday Materials	Compare the suitability of everyday materials for a specific job, e.g., building a bridge			Identify different materials based on their properties	

Opportunities to work scientifically

Year 2

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Uses of everyday materials	Compare materials to see which is the most waterproof			Group different materials based on their properties	
Animals, including humans			Research different food groups and design a balanced menu	Identify the off-spring of different animals	
Living things and their habitats			Research animals and how they adapt to their environment	Group animals based on their natural habitats	
Plants	Investigate which conditions plants need to grow	Change in plant growth over time		Identify parts of a plant	
Forces (Introduction)	Investigate the effect of force on the speed an object moves			Group materials based on how they react to a force (e.g., stretchy)	

Opportunities to work scientifically

Year 3

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Rocks and soil			Research how fossils and different types of rocks are formed	Identify different rocks and the group they belong to	
Animals, including humans		Observe the effect of excess sugar over time (based on egg shells)	Research animals to identify their animal group and habitat	Group/ classify and animal based on its group and species	
Plants		Observe how water travels up the stem	Research different types of seed dispersal		
Light	Compare materials based on reflectiveness	Shadow length throughout the day		Group materials based on their opacity and transparency	Object size compared to shadow
Forces and magnets	Compare materials based on the amount of friction they generate			Group magnetic and non-magnetic materials	

Opportunities to work scientifically

Year 4

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Electricity	Determine which materials are electrical conductors or insulators			Classify/ group materials into electrical conductors or insulators	
Animals, including humans			Research the different body parts involved in digestion	Classify plants/ animals into either producer, consumer or predator	
Living things and their habitats			Research the effect of climate change on animals around the world	Classify animals based on their observable characteristics	
States of Matter		Measure temperature changes in water over time	Research the water cycle and how it works	Identify solids, liquids or gases	
Sound	The affect of distance from the source on volume				Compare how length and width of tubes affect pitch

Opportunities to work scientifically

Year 5

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Earth and Space			Research the plants in our solar system, including length of orbit		Compare the distance a planet is from the Sun and its temperature
Animals, including humans			Research changes in humans at different stages in our lives		Compare height with physical task e.g., distance a ball is thrown
Forces	Shape of an object and the time it takes to travel through water				Surface material on a ramp and the distance/ speed it travels
Properties and changes of materials	Factors that affect the speed a solute dissolves in water, e.g., temperature	Observe over time the separation of a solute and solvent via evaporation		Classify/ group materials as either soluble or insoluble	
Living things and their habitats			Research the life cycle of different animal groups	Classify/ group and animal based on its group and species	16

Opportunities to work scientifically

Year 6

	Comparative and Fair Testing	Observations over time	Research using Secondary Sources	Grouping and Classifying	Pattern Seeking
Electricity	Effect of increasing voltage on the brightness of a bulb				Compare brightness of bulb in series and parallel circuits
Animals, including humans	Impact of exercise on the heart rate		Research how drugs affect the body		Compare resting heart rate of different people
Living things and their habitats		Conditions needed for bread to go mouldy	Research the different types of micro-organisms	Classify different types of arthropod	
Evolution and Inheritance			Research Charles Darwin and his work		Compare skulls/ body parts of animals as they have evolved
Light				Group materials based on transparency	Compare distance from light source and shadow ¹⁷

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Seasonal Change 1	Classification of Animals	Everyday Materials	Animals – Knowing seen parts of human body	Plants	Season Change 2
Year 2	Living things and their habitats	Plants 1	Materials and their everyday uses		Humans – Healthy living	Plants 2
Year 3	Light and dark	Rocks and soils	Forces and magnets		Plants	Skeletons and muscles
Year 4	Electricity	Digestive system and teeth		Sound	States of matter	Classification of animals
Year 5	Reversible and irreversible changes		Human life cycles		Earth and Space	Forces
Year 6	Electricity	Light	Heart and the circulatory system		Classification of all living things	Evolution and inheritance

Long-term overview for SCIENCE

YEAR 1

How do seasons change?

Name the seasons and know the months associated with each

Know about the type of weather in each season

Observe and know about the changes in the seasons

Science Knowledge

- Know the name the seasons
- Know about the weather associated with each season
- Know the months within each season

Working Scientifically

Observation over time

- Changes in temperature throughout the year
- Changes in rainfall throughout the year

Pattern seeking

- Length of daylight throughout the year
- Leaf colour and fall and different stages

Knowledge Organiser

Years 1

Subject: Science Main Learning: Season Change

Key knowledge

Know the main differences between the four seasons

Know the names of the four seasons

Know the type of weather normally associated with the four seasons

Know that we have longest periods of light in summer and shortest periods of light in winter

Know that different parts of the world have their summer and winter at different times to us

Know that the temperature varies during the different seasons

Vocabulary

Autumn

The time of year between September and November. Many leaves fall off the trees

Winter

The coldest season in the UK. We often have snow in this season. It occurs between December and February

Spring

The time of year between March and May. There is usually lots of signs of new growth in Spring

Summer

The hottest season in the UK. It happens between June and August.
The longest day is June 21st

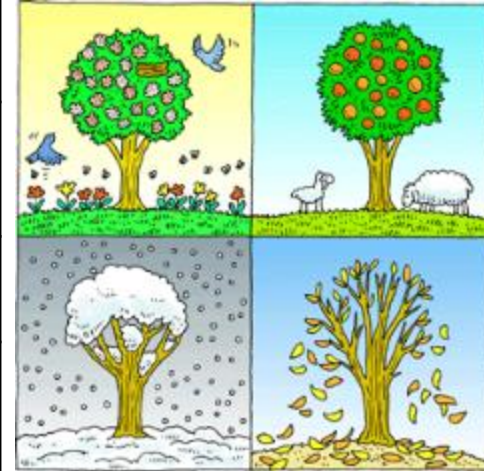
temperature

It is measurement of hot or cold that can be calculated using a thermometer

weather symbol



These are signs used to help us understand more about our daily weather



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 1

How are animals classified?

Know what we mean by
carnivore, omnivore and
herbivore

Know about and identify
reptiles, mammals and
amphibians

Recognise some of the
birds in the locality

Know how to sort by
living, not living and
never living

Science Knowledge

- Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds
- Know and classify animals by what they eat (carnivore, herbivore and omnivore)
- Know how to sort by living and non living things

Working Scientifically

Research using secondary sources

- Research animals that live in a particular habitat

Grouping and Classifying

- Group/ classify animals according to what they eat

Knowledge Organiser

Years 1

Subject: Science Main Learning: Animals

Key knowledge
Know how to classify a range of animals
Know the difference between carnivore, omnivore and herbivore
Know the difference between a mammal, reptile and amphibian
Know how to classify by living, non living and never alive
Know the names of some common birds
Begin to know why certain animals live in certain areas

Vocabulary	
amphibians	All begin their life in water with gills and tails. Examples are frogs and newts
reptiles	Are animals that are cold-blooded. Most lay eggs and their skin is covered with hard, dry scales
mammals	Are also warm blooded animals. They breath air and have a backbone
herbivore	A herbivore eats only plants
carnivore	Is a meat-eating animal that gets its food from killing other animals
omnivore	Eats plants and meat



	Prior Knowledge –
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Long-term overview for SCIENCE

YEAR 1

What are the materials that are around us called?

Know the name of the materials that make up the school

Know why some materials have been used for certain tasks

Work out which materials are suitable for certain things

Design a suitable bed for a favourite toy

Science Knowledge

- Know the name of the materials an object is made from
- Know about the properties of everyday materials

Working Scientifically

Comparative and Fair tests

- Compare the suitability of everyday materials for a specific job, e.g., building a bridge

Grouping and Classifying

- Identify different materials based on their properties

Knowledge Organiser

Years 1

Subject: Science Main Learning: Materials

Key knowledge
Know the names and uses of some common materials
Know that there are many different types of materials
Know the names of many types of materials
Know what we use glass, wood and bricks for
Know that plastics are easy to bend
Know that some materials are not useful for certain things

Vocabulary	
plastic	A 'man-made' material that can be shaped or moulded to any shape
stretch	A material that is like elastic
stiff	A material that is firm and hard and not flexible
metal	Are usually tough and strong material and can be heated and shaped into anything
liquid	Can flow and take on the shape of their container
gas	We can't see it, but it is all around us

MATERIALS



	Prior Knowledge –
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Long-term overview for SCIENCE

YEAR 1

What are our seen body parts called and what do we mean by the five senses?

Know the names of the seen parts of the human body

Know the names of the five senses

Science Knowledge

- Know the name of parts of the human body that can be seen
- Know about the five senses.

Working Scientifically

Pattern seeking

- Height and weight changes as we get older

Knowledge Organiser

Years 1

Subject: Science Main Learning: Parts of the Human Body

Key knowledge

Know the names of the seen parts of the human body

Know the names of all seen body parts above the shoulders

Know the names of the seen body parts below the shoulders and above the legs

Know the names of all seen body parts below the hips

Know what the five senses are

Know what each of our senses does

Vocabulary

toes

The digits at the end of our feet

fingers

The digits at the end of our fingers

touch

The sensation you get when you
Brush against something

hearing

The sound made by anything around

taste

The sensation you get when you eat

chest

The part of the body below the neck and shoulders and between the arms

hair

shoulder

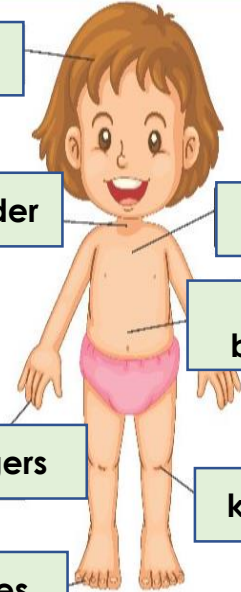
chest

belly button

fingers

knee

toes



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 1

What are the names of the different parts of plants?

Know the name of the main parts of plants, including roots, stem, leaf and petal

Know the part that each part of a plant plays in keeping a plant healthy

Name a number of wild and garden flowers

Name the main parts of a tree

Plant a seed or bulb and watch it grow

Science Knowledge

- Know and name a variety of common wild and garden plants
- Know and name the petals, stem, leaves and root of a plant
- Know and name the roots, trunk, branches and leaves of a tree

Working Scientifically

Observations over time

- Changes to plants/ trees as they grow or in different seasons

Grouping and Classifying

- Identify local trees and plants

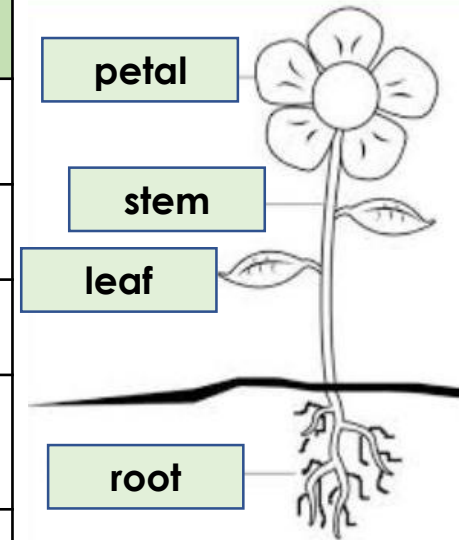
Knowledge Organiser

Years 1

Subject: Science Main Learning: Plants

Key knowledge
Know the names of parts of a plant
Know the names of a variety of common wild and garden plants
Know the name of the different parts of a plant, including stem, root, petal and flower
Know the difference between deciduous and evergreen trees
Know the names of a variety of common trees
Know the names of some of the plants that grow in the local environment

Vocabulary	
deciduous	Is the name given to trees that lose their leaves in autumn and are bare in the winter
evergreen	Is the name of trees that have leaves all year round
environment	The area where a plant or tree lives and thrives
blossom	Is the flower that comes before the fruit. For example, apple blossom comes before the apple starts to grow
petals	Is a part of the flower and is usually coloured. The colour attracts insects.
root	Is the part of the plant that is beneath the ground. It gives the plant food and keeps it steady



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 2

Why do animals choose the habitats they have?

Identify and name plants and animals in a range of habitats

Know how a specific habitat provides for the basic needs of things living there

Match living things to their habitat

Know how animals find their food

Name some different sources of food for animals

Science Knowledge

- Know and explain how seeds and bulbs grow into plants
- Know what plants need in order to grow and stay healthy (water, light & suitable temperature)

Working Scientifically

Researching

- Research animals and how they adapt to their environment

Grouping and Classifying

- Group animals based on their natural habitats

Knowledge Organiser

Years 2

Subject: Science

Main Learning: Animals and their habitats

Key knowledge

Know that animals have preference about the habitats they live in

Identify and name plants and animals in a range of habitats

Know how a specific habitat provides for the basic needs of things living there

Match living things to their habitat

Know how animals find their food

Name some different sources of food for animals

Vocabulary

habitat

Is a place that an animal lives. It provides the animal with food, water and shelter

rainforest

A habitat with a tropical forest with tall trees, warm climates and lots of rain

desert

A habitat that gets very little rain each year. Very few plants or animals live in desert areas

species

A group of animals, plants or other living things that all share common characteristics and that are all classified as alike in some way

pond

A body of water smaller than a lake. Ponds provide a habitat for a very wide range of wildlife

indigenous

Produced, growing, living, or occurring naturally in a particular region or environment



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 2

How do plants grow healthily?

Know the name of the main parts of plants, including roots, stem, leaf and petal

Know why plants need sunlight

Know the names of some trees in the locality

Know how to look after a plant over a long time

Know what will stop a plant from growing

Science Knowledge

- Classify things by living, dead or never lived
- Know how a specific habitat provides for the basic needs of things living there (plants and animals)
- Match living things to their habitat
- Name some different sources of food for animals
- Know about and explain a simple food chain

Working Scientifically

Fair testing

- Investigate which conditions plants need to grow

Observation over time

- Change in plant growth over time

Grouping and Classifying

- Identify parts of a plant

Knowledge Organiser

Years 2

Subject: Science **Main Learning: Plants and trees**

Key knowledge

Know what plants, including trees need to survive

Know that a plants needs light, water, air and soil to survive

Know how important trees are for the environment

Know that trees and shrubs take in water and a gas called carbon dioxide and give out a gas called oxygen

Know how to set up a fair test to find out what plants need to survive

Know the names of many of out most common trees by shape of leaf and shape of tree

Vocabulary

trunk

Holds up the trees' crown, protects its inner parts and works like a pipeline, transporting essential materials to the different parts of the tree

stem

Is the main part of the plant. It supports the weight of the leaves, as well as the flowers or fruit

blossom

Is the mass of flowers created by a tree. Almost all fruit bearing trees have blossom

bulbs

Are underground masses of food storage from which plants grow

woodland

Is a habitat where trees are the dominant plant form

crown

Is made up of the leaves and branches at the top of the tree



oak



horse chestnut

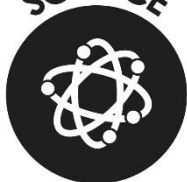


conifer



willow

SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 2

What are the properties of different materials?

Know why some materials are more suitable than others for specific uses

Know why glass, wood, plastic, brick or paper would be used for certain jobs

Know that some materials can be squashed, twisted or bent according to need

Know why certain materials are suitable for many different uses

Know about the lives of important people who have developed useful new materials

Science Knowledge

- Know how materials can be changed by squashing, bending, twisting and stretching
- Know why a material might or might not be used for a specific job

Working Scientifically

Fair testing

- Compare materials to see which is the most waterproof

Grouping and Classifying

- Group different materials based on their properties

Knowledge Organiser

Years 2

Subject: Science

Main Learning: Uses and properties of different materials

Key knowledge

Know about the properties and uses of different materials

Know why some materials are more suitable than others for specific uses

Know why glass, wood, plastic, brick or paper would be used for certain jobs

Know that some materials can be squashed, twisted or bent according to need

Know why certain materials are suitable for many different uses

Know about the lives of important people who have developed useful new materials

Vocabulary

stretching

Is to change shape by pulling it to make it longer or wider

squashing

Is pushing things closely together

bending

Is changing the shape and direction of something

twisting

Moving one part clockwise and the other part anticlockwise

John Dunlop

A person who improved the tyres on cars. You may see tyres on cars with the name DUNLOP on them

Charles Macintosh

He invented mackintoshes which was a special type of coat. We use the word 'mac' today because of his invention



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 2

Why is it important to keep our bodies healthy?

Know why a balanced is important for humans

Know what is meant by a balanced diet

Know why exercise and good hygiene are also important for humans

Know that the babies will grow into adults

Know what humans need to survive (including food and water)

Science Knowledge

- Know the basic stages in a life cycle for animals, (including humans)
- Know why exercise, a balanced diet and good hygiene are important for humans

Working Scientifically

Research

- Research different food groups and design a balanced menu

Grouping and Classifying

- Identify the off-spring of different animals

Knowledge Organiser

Years 2

Subject: Science **Main Learning: Healthy living**

Key knowledge

Know how important it is to keep our bodies healthy

Know why a balanced is important for humans

Know what is meant be a balanced diet

Know why exercise and good hygiene are also important for humans

Know that the babies will grow into adults

Know what humans need to survive (including food and water)

Vocabulary

proteins

Is a food group which includes meat, eggs, fish, dairy products, nuts and seeds

carbohydrates

Are sugars and starches, which are found in foods such as starchy vegetables, grains, rice, breads, and cereals

off-spring

Refers to a person's children or an animal's young

fats

Are found in meat and other animal products, such as butter and cheese

nutrition

Is the process by which the body nourishes itself by transforming food into energy and body tissues

hygiene

Taking care of our body by being clean and making sure we don't smell



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 3

Why do we have light and dark and what is its impact on our everyday life?

Know what dark is (in relation to absence of light)

Know that we need light so we can see things

Know that light can be reflected

Know how a shadow is formed and why they change shape

Know the dangers of looking directly at the Sun

Science Knowledge

- Know that dark is the absence of light
- Know that light is needed in order to see and is reflected from a surface
- Know and demonstrate how a shadow is formed and explain how a shadow changes shape
- Know about the danger of direct sunlight and describe how to keep protected

Working Scientifically

Fair testing

- Compare materials based on reflectiveness

Observation over time

- Shadow length throughout the day

Grouping and Classifying

- Group materials based on their opacity and transparency

Pattern Seeking

- Object size compared to shadow

Knowledge Organiser

Years 3

Subject: Science Main Learning: Light and Dark

Key knowledge

Know why we have light and dark and its impact on our everyday life

Know what dark is (in relation to absence of light)

Know that we need light so we can see things

Know that light can be reflected

Know how a shadow is formed and why they change shape

Know the dangers of looking directly at the Sun

Vocabulary

reflection

Occurs when a ray of light hits a surface and bounces off

shadows

Is formed when an object blocks out the light. The object must be opaque or translucent to make a shadow

opaque

Opaque objects do not allow light to pass through them, in most cases creating a shadow

refraction

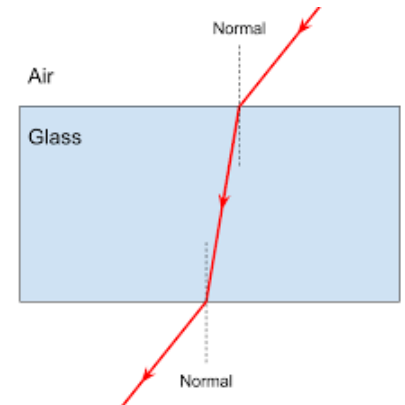
It is the change of direction of a light ray as it passes through different surfaces, for example, from air to water

convex

These are lenses, also called positive lenses. Are lenses that curve outward from the edges to the centre

concave

This is a lens where the centre of the lens is thinner than the edges



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 3

What are the main types of rocks on our Earth?

Know how fossils are formed

Know what soil is

Know the difference between igneous, sedimentary and metamorphic rocks

Group together different rocks according to different attributes

Know that some crystals are extremely rare and valuable

Science Knowledge

- Compare and group rocks based on their appearance and physical properties, giving reasons
- Know how soil is made and how fossils are formed
- Know about and explain the difference between sedimentary, metamorphic and igneous rock

Working Scientifically

Research

- Research how fossils and different types of rocks are formed

Grouping and Classifying

- Identify different rocks and the group they belong to

Knowledge Organiser

Years 3

Subject: Science

Main Learning: Rocks

Key knowledge

Know that the Earth is made up of different types of rocks

Know how fossils are formed

Know what soil is

Know the difference between igneous, sedimentary and metamorphic rocks

Group together different rocks according to different attributes

Know that some crystals are extremely rare and valuable

Vocabulary

sedimentary

Are formed when sand, mud and pebbles get laid down in layers. Over time, these layers are squashed under more and more layers

metamorphic

When a rock experiences heat and pressure, it becomes a metamorphic rock

igneous

Is formed when magma cools and solidifies. It may do this above or below the Earth's surface

crystals

These are a special kind of solid material where the molecules fit together in a repeating pattern

fossil

A fossil is the preserved remains or traces of a dead organism

soil

Consists of a mix of organic material (decayed plants and animals) and broken bits of rocks and minerals



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 3

What do we mean by a 'force'?

Know how different surfaces speed things up or slows things down

Know what a pulley is and how it works

Know how magnets work

Science Knowledge

- Know about and describe how objects move on different surfaces
- Know how a simple pulley works and use it to lift an object
- Know how some forces require contact and some do not, giving examples
- Know about and explain how magnets attract and repel. Predict whether magnets will attract or repel and give a reason

Working Scientifically

Fair testing

- Compare materials based on the amount of friction they generate

Grouping and Classifying

- Group magnetic and non-magnetic materials

Knowledge Organiser

Years 3

Subject: Science **Main Learning: Forces and magnets**

Key knowledge

Know what we mean by a 'force'

Know how different surfaces speed thing up or slows things down

Know what a pulley is and how it works

Know how magnets work

Vocabulary

repel

Two (magnetic) poles which are the same will repel each other

attract

Two (magnetic) poles which are not the same will attract each other

Pole

There are two Poles on Earth a South Pole and North Pole

pulley

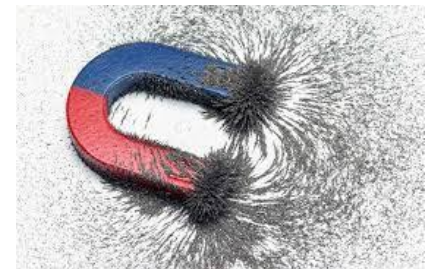
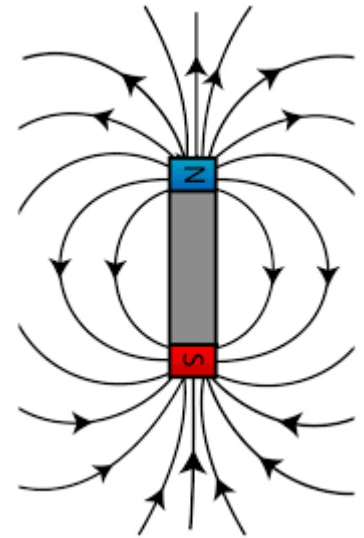
A collection of one or more wheels over which you loop a rope to make it easier to lift things

magnet

A material or object that creates a magnetic force

magnetism

Magnetism is a force that can be felt by metals such as iron, steel, nickel and cobalt.



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 3

What does a plant needs to flourish?

Know the function of the different parts of the flowering plant

Know that light, air, water, nutrients from soil are all important for plant growth

Find out how water is transported within a plant

Know the part that flowers play in the life cycle of a flowering plant

Know about pollination, seed formation and seed dispersal

Science Knowledge

- Know the function of different parts of flowing plants and trees
- Know what pollination is
- Know about seed dispersal

Working Scientifically

Observation over time

- Observe how water travels up the stem

Research

- Research different types of seed dispersal

Knowledge Organiser

Years 3

Subject: Science Main Learning: Plants

Key knowledge

Understand what a plant needs to flourish and find out about its life cycle

Know the function of the different parts of the flowering plant

Know that light, air, water, nutrients from soil are all important for plant growth

Find out how water is transported within a plant

Know the part that flowers play in the life cycle of a flowering plant

Know about pollination, seed formation and seed dispersal

Vocabulary

pollination

This is the act of transferring pollen grains from the male anther of a flower to the female stigma

seed dispersal

Is the movement or transport of seeds away from the parent plant

seed formation

A seed is a small baby plant enclosed in a covering called the seed coat, usually with some stored food

nutrients

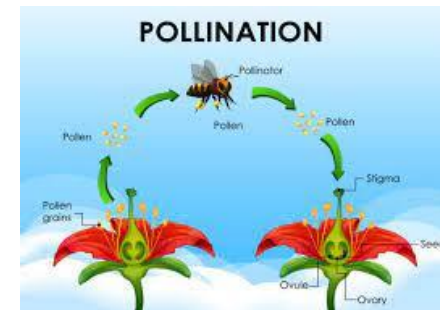
Are the food the plant wants. Most of the plant's nutrients comes from the soil

stigma

This is usually sticky and receives pollen

anther

The stamen has a pollen producing structure at the end which is called the anther



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 3

Why do humans have skeletons and muscles?

Know the names of the body parts associated with skeleton and muscles

Know that the body parts have special functions

Know what the function of muscles are

Know what joints are and how they work

Compare the diets of different groups of animals, including humans

Science Knowledge

- Know about the importance of a nutritious, balanced diet
- Know how nutrients, water and oxygen are transported within animals and humans
- Know about the skeletal and muscular system of a human

Working Scientifically

Observation over time

- Observe the effect of excess sugar over time (based on egg-shells)

Research

- Research animals to identify their animal group and habitat

Grouping and classifying

- Group/ classify and animal based on its group and species

Knowledge Organiser

Years 3

Subject: Science **Main Learning: Human Body – Skeletons and muscles**



Key knowledge
Know that humans have skeletons and muscles for support, protection and movement
Know the names of the body parts associated with skeleton and muscles
Know that the body parts have special functions
Know what the function of muscles are
Know what joints are and how they work
Compare the diets of different groups of animals, including humans

Vocabulary	
skeleton	Is made of bone and grows as we grow. Our skull protects our brain and our ribs protect our heart and lungs
muscles	These are attached to bones by tendons and help them to move
joint	Allow the body to make movements. The body has many bones and are connected through the joints
cartilage	Is a connective tissue found in many areas of the body including joints between bones e.g. the elbows
tendon	Muscles are attached to the bone by tendons and work in pairs to allow for smooth movement.
spine	Also known as your backbone, it is a strong, flexible column of ring-like bones that runs from your skull to your pelvis.

SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 4

What is electricity and why it so important in our lives?

Know about common appliances that run on electricity

Know how to construct a simple series electrical circuit

Identify and name the basic parts of the circuit, including cells, wires, bulbs, switches and buzzers

Know that a switch opens and closes a circuit

Know about some common conductors and insulators

Science Knowledge

- Identify and name appliances that require electricity to function
- Construct a series circuit
- Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers)
- Predict and test whether a lamp will light within a circuit
- Know the function of a switch
- Know the difference between a conductor and an insulator; giving examples of each

Working Scientifically

Fair testing

- Determine which materials are electrical conductors or insulators

Grouping and classifying

- Classify/ group materials into electrical conductors or insulators

Knowledge Organiser

Years 4

Subject: Science **Main Learning: Electricity**

Key knowledge

Know what electricity is and why it so important in our lives

Know about common appliances that run on electricity

Know how to construct a simple series electrical circuit

Identify and name the basic parts of the circuit, including cells, wires, bulbs, switches and buzzers

Know that a switch opens and closes a circuit

Know about some common conductors and insulators

Vocabulary

circuit

Is a completed path through which an electrical current flows

conductor

Is an object or type of material that allows the flow of an electrical current in one or more directions

insulator

Is a material whose internal electric charges do not flow freely

battery

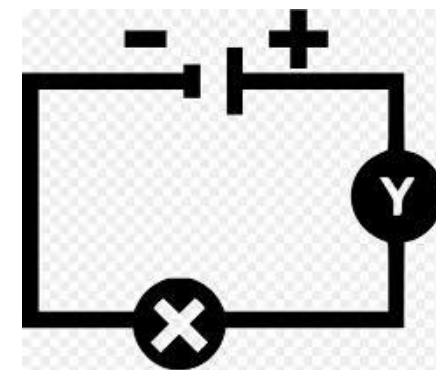
Is a device that stores chemical energy and makes it available in an electrical form

cells

An electrical cell is a device that is used to generate electricity

appliance

Is a device that uses electricity to perform a function



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 4

What happens to the food we eat?

Know and name the parts of the digestive system

Know about the function of each organ of the digestive system

Know and identify the different types of teeth in humans

Know the function of different human teeth

Construct and use food chains to identify producers, predators and prey

Science Knowledge

- Identify and name the parts of the human digestive system
- Know the functions of the organs in the human digestive system
- Identify and know the different types of human teeth
- Know the functions of different human teeth
- Use and construct food chains to identify producers, predators and prey

Working Scientifically

Research

- Research the different body parts involved in digestion

Grouping and classifying

- Classify plants/ animals into either producer, consumer or predator

Knowledge Organiser

Years 4

Subject: Science **Main Learning: Digestive system**

Key knowledge
Know exactly what happens to the food we eat
Know and name the parts of the digestive system
Know about the function of each organ of the digestive system
Know and identify the different types of teeth in humans
Know the function of different human teeth
Construct and use food chains to identify producers, predators and prey

Vocabulary	
oesophagus	This is like a stretchy tube that moves food from the back of the throat to the stomach
pancreas	This produces juices called enzymes which help the body digest food
organ	The skin is the biggest organ of your body. Other organs include your brain, lungs, heart, liver, stomach, intestines, pancreas, and kidneys, all called internal organs
intestine	The small intestine absorbs nutrients and minerals from food. The large intestine absorbs water from the remaining indigestible food
molars	These are teeth that are used for chewing and grinding our food
canine	These are teeth used for ripping and tearing our food. We have two located at the top of our mouth and two at the bottom



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 4

How is sound is created and how does it travel?

Know how sound is made and what happens as sound travels away from its source

Know how sound travels from the source to the ears

Know to associate sound with vibration

Know the correlation between pitch and the object producing a sound

Know the correlation between the volume of a sound and the strength of the vibrations that produced it

Science Knowledge

- Know how sound is made, associating some of them with vibrating
- Know how sound travels from a source to our ears
- Know the correlation between pitch and the object producing a sound
- Know the correlation between the volume of a sound and the strength of the vibrations that produced it
- Know what happens to a sound as it travels away from its source

Working Scientifically

Fair testing

- The affect of distance from the source on volume

Pattern seeking

- Compare how length and width of tubes affect pitch

Knowledge Organiser

Years 4

Subject: Science Main Learning: Sound

Key knowledge

Know how we get to hear things and how sound is created

Know how sound is made and what happens as sound travels away from its source

Know how sound travels from the source to the ears

Know to associate sound with vibration

Know the correlation between pitch and the object producing a sound

Know the correlation between the volume of a sound and the strength of the vibrations that produced it

Vocabulary

pitch

A high sound has a high pitch and a low sound has a low pitch

volume

Is the perception of loudness from the intensity of a sound wave. The higher the intensity of a sound, the louder it is perceived in our ears

vibrating

Sound is caused by the vibration of a medium (usually air) and it travels in waves

frequency

This is measured as the number of wave cycles that occur in one second

vibrating

Sound is caused by the vibration of a medium (usually air) and it travels in waves

hammer

The ear has little bones called ossicles that help you hear. They are called the hammer (malleus), anvil (incus), and stirrup (stapes). They amplify the sound or make it louder



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 4

Why do some solids, liquids and gases change state?

Know that certain materials can change state

Know what the temperature of water is when it boils or freezes

Know which materials, other than water, changes state

Explain the differences between solids, liquids and gases

Know what is meant by the terms: condensation, and evaporation

Science Knowledge

- Know the temperature at which materials change state
- Know about and explore how some materials can change state
- Know the part played by evaporation and condensation in the water cycle

Working Scientifically

Observation over time

- Measure temperature changes in water over time

Research

- Research the water cycle and how it works

Grouping

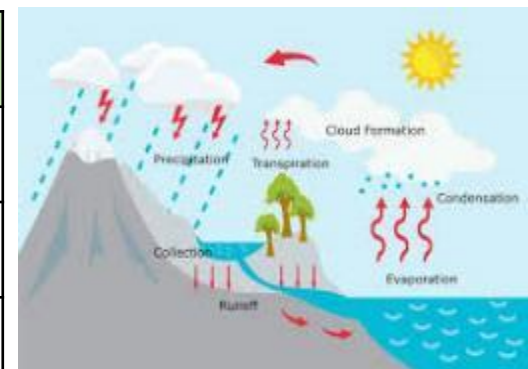
- Identify solids, liquids or gases

Knowledge Organiser

Years 4

Subject: Science Main Learning: States of Matter

Key knowledge	Vocabulary	
Know that some solids, liquids and gases change states	evaporation	when a liquid changes to a gas
Know that certain materials can change state	condensation	when a gas changes into a liquid
Know what the temperature of water is when it boils or freezes	melting	when a solid becomes a liquid
Know which materials, other than water, changes state	solidifying	when a liquid becomes a solid
Explain the differences between solids, liquids and gases	precipitation	rain, snow, sleet and hail
Know what is meant by the terms: condensation, and evaporation	degrees - Celsius	the most common unit of temperature



Ice

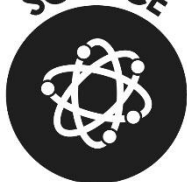


Water



Steam

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Prior Knowledge –

Long-term overview for SCIENCE

YEAR 4

How are living things grouped?

Explore and use
classification keys to
group living things

Know that plants can be
grouped into flowering
and non flowering plants

Know that animals can
be grouped into
amphibians, reptiles,
birds, mammals and fish

Recognise that
environments can
change for good

Recognise that some changes
to the environment can be a
danger to living things

Science Knowledge

- Use classification keys to group, identify and name living things
- Know how changes to an environment could endanger living things
- Group materials based on their state of matter (solid, liquid or gas)

Working Scientifically

Research

- Research the effect of climate change on animals around the world

Grouping

- Classify plants/ animals into either producer, consumer or predator

Knowledge Organiser

Years 4

Subject: Science

Main Learning: Living things and their habitats

Key knowledge

Know that living things can be grouped in a variety of ways

Explore and use classification keys to group living things

Know that plants can be grouped into flowering and non flowering plants

Know that animals can be grouped into amphibians, reptiles, birds, mammals and fish

Recognise that environments can change for good

Recognise that some changes to the environment can be a danger to living things

Vocabulary

flowering plants

These plants produce seeds, fruits, and flowers. Most deciduous trees belong to this group

invertebrates

These do not have skeletons or backbones

insects

Small and often winged animals that are arthropods having six jointed legs and a body formed of a head, thorax, and abdomen

deforestation

The act of cutting down huge numbers of trees, such as is happening in many rainforests

pollution

Pollution happens when the environment is contaminated, or dirtied, by waste, chemicals, and other harmful substances

industrial waste

This is material which is created when making products – if they are disposed of carefully, it can be a danger to the environment



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Prior Knowledge –

Long-term overview for SCIENCE

YEAR 5

Which materials can or cannot be changed back to their original form?

Know what a reversible and irreversible change means

Give examples of reversible and irreversible changes

Experiment to find which materials can be changed back to their original state

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

Science Knowledge

- Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets)
- Know and explain how a material dissolves to form a solution
- Know and show how to recover a substance from a solution
- Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating)
- Know and demonstrate that some changes are reversible and some are not
- Know how some changes result in the formation of a new material and that this is usually irreversible

Working Scientifically

Fair testing

- Factors that affect the speed a solute dissolves in water, e.g., temperature

Observation over time

- Observe over time the separation of a solute and solvent via evaporation

Grouping

- Classify/ group materials as either soluble or insoluble

Knowledge Organiser

Years 5

Subject: Science **Main Learning: Reversible and irreversible changes**

Key knowledge

Know about materials that can or cannot be changed back to their original form once an action has been taken

Know what a reversible change means

Know what an irreversible change means

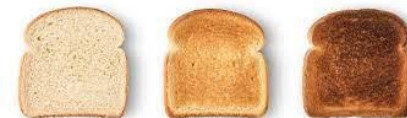
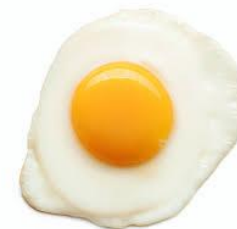
Give examples of reversible and irreversible changes

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

Vocabulary

dissolve	To become broken up or absorbed by something or to disappear into something else
solubility	Is a chemical property referring to the ability for a given substance to dissolve in a solvent
filtering	To pass a substance through a device which is designed to remove certain particles contained within
melting	A physical process that results in the transition of a substance from a solid to a liquid
separating	Separate, part, and divide mean to break into parts or to keep apart
thermal	Something that is thermal is hot, retains heat, or has a warming effect



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 5

What do we know about the life cycles of humans and various animals?

Know about the life cycle of a human being

Know what the terms puberty, gestation and reproduction mean

Know the life cycle of different living things, e.g. mammal, amphibian, insect and bird

Know about the process of reproduction in plants

Know about the process of reproduction in animals

Science Knowledge

- Know the life cycle of different living things e.g. mammal, amphibian, insect and bird
- Know the differences between different life cycles
- Know the process of reproduction in plants
- Know the process of reproduction in animals
- Create a timeline to indicate stages of growth in humans

Working Scientifically

Research

- Research changes in humans at different stages in our lives
- Research the life cycle of different animal groups

Grouping

- Classify/ group and animal based on its group and species

Pattern seeking

- Compare height with physical task e.g., distance a ball is thrown

Knowledge Organiser

Years 5

Subject: Science **Main Learning: Life cycle, including humans**



Key knowledge

Know about the life cycles of humans and various animals

Know about the life cycle of a human being

Know what the terms puberty, gestation and reproduction mean

Know the life cycle of different living things, e.g. mammal, amphibian, insect and bird

Know about the process of reproduction in plants

Know about the process of reproduction in animals

Vocabulary

puberty

Is the name for the time when your body begins to develop and change as you move from childhood to adulthood

gestation

Is the time between conception and birth, during which the embryo is developing in the uterus

reproduction

Is the way different plants and animals make new plants and animals. The reproduction system differs in plants and animals

embryo

Fertilisation happens when an egg cell meets with a sperm cell and joins with it. The fertilised egg divides to form a ball of cells called an embryo

obese

Obesity is the condition of being much too heavy for one's height so that one's health is affected

teenager

The age between thirteen and nineteen

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Prior Knowledge –

Long-term overview for SCIENCE

YEAR 5

What do we know about the Sun, Earth, Moon and the Planets

Know about and explain the movement of the Earth and other planets relative to the Sun

Know about and explain the movement of the Moon relative to the Earth

Know and demonstrate how night and day are created

Describe the Sun, Earth and Moon (using the term spherical)

Know information about the planets

Science Knowledge

- Know about and explain the movement of the Earth and other planets relative to the Sun
- Know about and explain the movement of the Moon relative to the Earth
- Know and demonstrate how night and day are created
- Describe the Sun, Earth and Moon (using the term spherical)

Working Scientifically

Research

- Research the planets in our solar system, including length of orbit

Pattern seeking

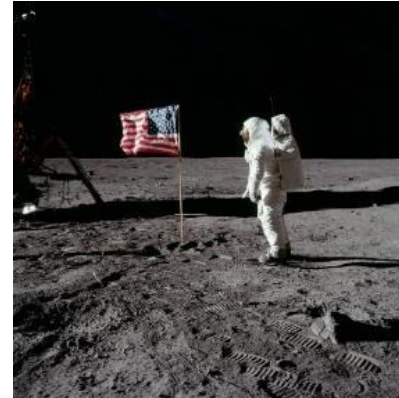
- Compare height with physical task e.g., distance a ball is thrown

Knowledge Organiser

Years 5

Subject: Science Main Learning: Earth and Space

Key knowledge	Vocabulary	
Know about the Sun, Earth, moon and the plants	solar system	Is made of the eight planets that orbit our sun; it is also made of asteroids, moons, comets and lots more
Know about and explain the movement of the Earth and other planets relative to the Sun	planet	There are 8 planets in our solar system, they are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune
Know about and explain the movement of the Moon relative to the Earth	spherical	Something spherical is like a sphere in being round, or more or less round, in three dimensions
Know and demonstrate how night and day are created	crescent moon	It is a slither of the moon that is lit up and can be seen and is less than half the moon
Describe the Sun, Earth and Moon (using the term spherical)	gibbous moon	A gibbous moon occurs when the moon is three-quarters lit up
Know information about the planets	eclipse	This occurs when an astronomical object is temporarily obscured. A lunar eclipse happens when the Earth moves between the Sun and the Moon and blocking the Sun's rays from striking the Moon



A circular logo with the word "SCIENCE" in a curved font at the top. Below it is a stylized atomic symbol with a central nucleus and three orbiting electrons.	Prior Knowledge –
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Long-term overview for SCIENCE

YEAR 5

What is a force and how does it impact on the way things move?

Know what gravity is and its impact on our lives

Identify and know the effect of air resistance

Identify and know the effect of water resistance

Identify and know the effect of friction

Explain how levers, pulleys and gears allow a smaller force to have a greater effect

Science Knowledge

- Know what gravity is and its impact on our lives
- Identify and know the effect of air and water resistance
- Identify and know the effect of friction
- Explain how levers, pulleys and gears allow a smaller force to have a greater effect

Working Scientifically

Fair testing

- Shape of an object and the time it takes to travel through water

Pattern seeking

- Surface material on a ramp and the distance/ speed it travels

Knowledge Organiser

Years 5

Subject: Science Main Learning: Forces

Key knowledge

Know what a force is and how it impacts on the way things move

Know what gravity is and its impact on our lives

Identify and know the effect of air resistance

Identify and know the effect of water resistance

Identify and know the effect of friction

Explain how levers, pulleys and gears allow a smaller force to have a greater effect

Vocabulary

friction

A force between two surfaces that are sliding, or trying to slide, across each other

gravity

A force which tries to pull two objects towards each other

air resistance

A type of friction between air and another material. For example, when an aeroplane flies through the air

water resistance

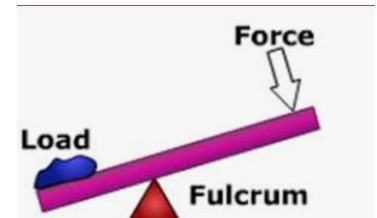
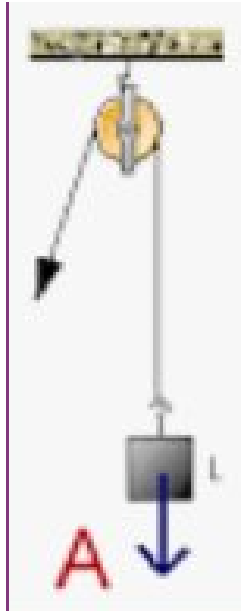
If you go swimming, there is friction between your skin and the water particles

levers

A long rigid body with a fulcrum along its length

pulleys

A simple machine and comprises of a wheel on a fixed axle, with a groove along the edges to guide a rope or cable



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 6

How does electricity work and how does its power vary?

Know that the brightness of a bulb is associated with the voltage

Compare and give reasons for variations in how components function

Use recognised symbols when representing a simple circuit in a diagram

Construct simple series circuits

Be able to answer questions about what happens when they try different components, for example; switches, bulbs, buzzers and motors

Science Knowledge

- Compare and give reasons for why components work and do not work in a circuit
- Draw circuit diagrams using correct symbols
- Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer

Working Scientifically

Fair testing

- Effect of increasing voltage on the brightness of a bulb

Pattern seeking

- Compare brightness of bulb in series and parallel circuits

Knowledge Organiser

Years 6

Subject: Science Main Learning: Electricity

Key knowledge

Understand how electricity works and how its power can vary

Know that the brightness of a bulb is associated with the voltage

Compare and give reasons for variations in how components function

Use recognised symbols when representing a simple circuit in a diagram

Construct simple series circuits

Be able to answer questions about what happens when they try different components, for example; switches, bulbs, buzzers and motors

Vocabulary

series circuits

Is a circuit that has more than one resistor, but only one path through which the electricity (electrons) flows

cells

Is a device that is used to generate electricity, or one that is used to make chemical reactions possible by applying electricity

generator

A machine that converts energy into electricity

turbine

A machine that creates continuous power in which a wheel, or something similar, moves round and round by fast moving water, steam, gas or air

fuses

These are safety devices. They are strips of wire that melts and breaks an electric circuit if it goes over a safe level

socket

A safe device to plug your electrical items into at home. Almost every room at home will have at least one socket

Component	Symbol	Purpose
Cell (Battery)		Provides electrical energy
Power supply		Alternative to using cells
Wire		Allows current to travel
Bulb/light		Converts electrical energy into heat and light
Motor		Converts electrical energy into movement energy
Buzzer		Converts electrical energy into sound energy
Switch		Allows circuit to be opened or closed



SCIENCE



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 6

How do our eyes help us see?

Know that light travels in straight lines

Understand that because light travels in straight lines objects are seen because they give out or reflect light into the eye

Know how our eyes work

Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes

Know that light travels in straight lines and therefore shadows have the same shape as the objects that cast them

Science Knowledge

- Know how light travels
- Know and demonstrate how we see objects
- Know why shadows have the same shape as the object that casts them
- Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Working Scientifically

Grouping and Classifying

- Group materials based on transparency

Pattern seeking

- Compare distance from light source and shadow

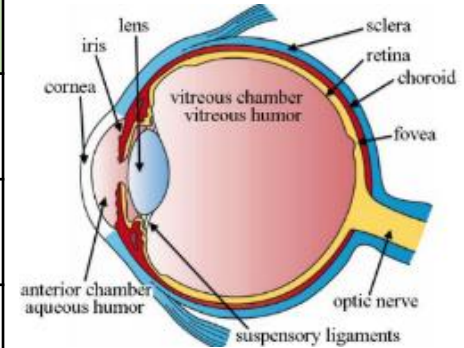
Knowledge Organiser

Years 6

Subject: Science Main Learning: Light

Key knowledge
Know why we can see and the part our eyes have in helping us see
Know that light travels in straight lines
Understand that because light travels in straight lines objects are seen because they give out or reflect light into the eye
Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
Know that light travels in straight lines and therefore shadows have the same shape as the objects that cast them
Know how our eyes work

Vocabulary	
retina	This is at the back of your eye and it has light-sensitive cells called rods and cones
cornea	This is a thin, clear and covers your eye. It's important because it helps you see by focusing light as it enters the eye
iris	By opening and closing the pupil, the iris controls the amount of light that enters the eye
pupil	Can be compared with the shutter of a camera. It is surrounded by the iris which is the coloured part of the eye
lens	Is a curved piece of glass or plastic designed to refract light in a specific way
light wave	One of the characteristics of light is that it behaves like a wave. Light can be defined by its wavelength and frequency. The frequency is how fast the waves vibrate up and down



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 6

How does the heart work and why is it so important?

Identify and name the main parts of the human circulatory system

Know the function of the heart, blood vessels and blood

Know the impact of diet, exercise, drugs and lifestyle on health

Know the ways in which nutrients and water are transported in animals, including humans

Know who William Harvey was

Science Knowledge

- Identify and name the main parts of the human circulatory system
- Know the function of the heart, blood vessels and blood
- Know the impact of diet, exercise, drugs and lifestyle on health
- Know the ways in which nutrients and water are transported in animals, including humans

Working Scientifically

Fair testing

- Impact of exercise on the heart rate

Research

- Research how drugs affect the body

Pattern seeking

- Compare resting heart rate of different people

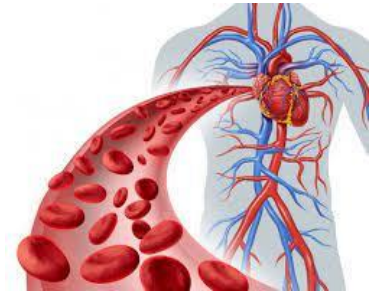
Knowledge Organiser

Years 6

Subject: Science Main Learning: Circulatory system

Key knowledge
Know about the function of the heart and the importance of blood in keeping us alive
Identify and name the main parts of the human circulatory system
Know the function of the heart, blood vessels and blood
Know the impact of diet, exercise, drugs and lifestyle on health
Know the ways in which nutrients and water are transported in animals, including humans
Know who William Harvey was

Vocabulary	
atria	The two uppermost chambers of the heart. Blood is pushed from the atria to the ventricles
cardiovascular	The blood circulatory system (cardiovascular system) delivers nutrients and oxygen to all cells in the body
capillaries	Are very thin blood vessels. They bring nutrients and oxygen to tissues and remove waste products
pulse	Your heart has to push so much blood through your body that you can feel a little thump in your arteries each time the heart beats
ventricles	The two lower chambers in the heart
blood vessels	A series of tubes inside your body. They move blood to and from your heart



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 6

How are living things grouped and classified?

Be able to classify living things into broad groups according to observable characteristics and based on similarities and differences

Know how living things have been classified

Give reasons for classifying plants and animals based on specific characteristics

Know about vertebrate and invertebrate animals

Know who Carl Linnaeus was

Science Knowledge

- Classify living things into broad groups according to observable characteristics and based on similarities and differences
- Know how living things have been classified
- Give reasons for classifying plants and animals in a specific way

Working Scientifically

Observation over time

- Conditions needed for bread to go mouldy

Research

- Research the different types of micro-organisms

Pattern seeking

- Compare resting heart rate of different people

Knowledge Organiser

Years 6

Subject: Science **Main Learning: Classification of all living things, including micro-organisms**

Key knowledge
Understand how all living things are grouped and classified
Be able to classify living things into broad groups according to observable characteristics and based on similarities and differences
Know how living things have been classified
Give reasons for classifying plants and animals based on specific characteristics
Know about vertebrate and invertebrate animals
Know who Carl Linnaeus is

Vocabulary	
vertebrates	An animal that has a backbone
invertebrates	An animal that does not have a backbone and 97% of creatures belong to this group
species	This is the grouping together of similar types of plants, animals and other organisms that can reproduce with each other
fungi	A classification or group of living organisms. This means they are not animals, plants, or bacteria
bacteria	Are tiny little organisms that are everywhere around us
algae	A single or multi-cellular organism that has no roots, stems or leaves and is often found in water



Prior Knowledge –

Long-term overview for SCIENCE

YEAR 6

How have living things on Earth changed over time?

Know that living things have changed over time

Know the part fossils play in helping us understand more about living things that inhabited our Earth millions of years ago

Know that living things produce off-spring of the same kind

Know that off-spring vary and are not normally 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

Science Knowledge

- Know how the Earth and living things have changed over time
- Know how fossils can be used to find out about the past
- Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents)
- Know how animals and plants are adapted to suit their environment
- Link adaptation over time to evolution
- Know about evolution and can explain what it is

Working Scientifically

Research

- Research Charles Darwin and his work

Pattern seeking

- Compare skulls/ body parts of animals as they have evolved

Knowledge Organiser

Years 6

Subject: Science

Main Learning: Evolution and inheritance

Key knowledge

Know how living things on Earth have changed over time

Know that living things have changed over time

Know the part fossils play in helping us understand more about living things that inhabited our Earth millions of years ago

Know that living things produce off-spring of the same kind

Know that off-spring vary and are not normally 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

Vocabulary

off-spring

When living things reproduce they pass on characteristics to their offspring. All living things produce offspring of the same kind, but normally offspring are not identical to their parents

adaptation

Is the process by which animals, plants and other living things have changed so that they better suit their habitat

evolution

Is the theory that all the kinds of living things that exist today developed from earlier types

inheritance

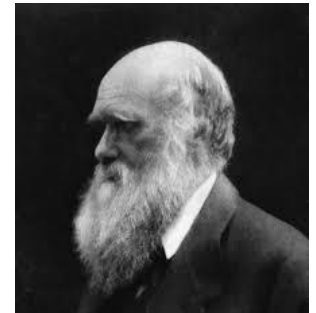
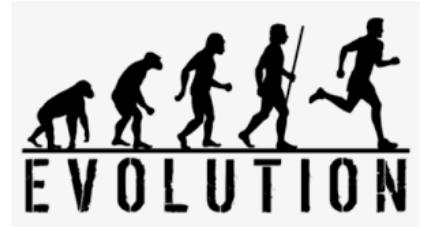
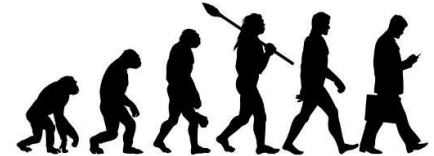
When living things reproduce they pass on characteristics to their offspring. This is known as inheritance

palaeontologist

A palaeontologist is someone studying the life of past geological periods, as known from fossil remains

genotype

A genotype refers to a particular gene or set of genes carried by an individual



SCIENCE



Prior Knowledge –