



Welton St Mary's Church of England Primary Academy














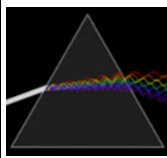





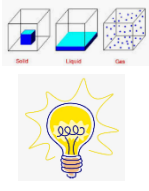










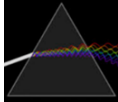

Science Curriculum

‘Wisdom begins in wonder’ Socrates

Science intent

Children are naturally curious and we encourage them to ask questions, wonder, consider and reason. We want them to be inquisitive and then apply a range of scientific enquiry to explore ideas independently and when working with others. Through our curriculum, we want to promote curiosity, provide opportunities for critical analysis and evaluation of evidence, foster respect for all things living and non-living and enrich children’s learning with a range of higher-level vocabulary which enables them to express their thoughts and aids communication. We aim to equip our children with the scientific enquiry skills and scientific knowledge to understand the uses and implications of science today and in the future; including that that they need for their education, their careers and beyond.

Science Overview

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 1	Plants 	Seasonal change 	Materials 	Animals including humans 		
Year 2	Living things and their habitats 		Animals including humans 	Plants 	Materials and their properties 	Plants 
Year 3	Animals including humans 	Rocks 	Light 	Forces and magnets 	Plants 	Animals including humans 
Year 4	Sound 	Animals including humans 	States of matter & Electricity 	Living things and their habitats 		Electricity 
Year 5	Living Things and their Habitats 	Animals including humans 	Properties and Changes of Materials 	Earth and Space 	Forces 	
Year 6	Animals including humans 	Electricity 	Evolution & inheritance 	Light 	Living things and their habitats 	

Core Concepts

CONCEPT – investigating, exploring, researching

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer different scientific questions about the world around them
- Observing over time, pattern seeking, identifying, classifying and grouping, comparative and fair testing, researching using secondary sources

CONCEPT - analysing and interpreting data

- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer different scientific questions about the world around them
- Apply mathematical knowledge to the understanding of science including collecting, presenting and analysing data

CONCEPT –science explanation and communication

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer different scientific questions about the world around them
- Build up and extend specialist vocabulary

CONCEPT – influences on life today

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Are equipped with the scientific knowledge required to understand the uses and implications of science today and for the future

Starting point questions for investigation

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 1	Plants	Seasonal change In which season does it rain the most? Do the largest leaves fall from deciduous trees first? Where does rain come from? What is this magic snow?	Materials What is the best recipe for making bubbles? What is the best material to make a raincoat for teddy? Which cloth shall I use? Hubble bubble- What will happen?		Animals including humans Can the people with the longest legs run the fastest? Which food do woodlice prefer? Which soil shall a use to grow the tallest sunflower?	
Year 2	Living things and their habitats Which habitats do worms prefer?		Animals including humans	Plants Do the biggest seeds grow in to the tallest plants?	Materials and their properties What is the best recipe for making slime? Which is the best material to fix the hole in the umbrella? Would a paper boat float forever?	Plants What liquid is the best for watering plants?

Year 3	Animals including humans Which liquid gets the M off an M&M the fastest?	Rocks What is the best ratio of vinegar to bicarbonate of soda to make the volcano spurt for the longest? Which soil absorbs the most water?	Light Which pair of sunglasses offers the best protection for our eyes?	Forces and magnets What is the best amount of water to use to make the rocket travel the furthest	Plants What is the optimum temperature for plants to germinate? What happens to celery when left in a glass of coloured water? What will happen to other plants left in coloured water?	Animals including humans
Year 4	Sound Investigating ear gongs What is the best material for making ear defenders?	Animals including humans	States of matter & Electricity What is the best temperature for the rocket launch? What is the quickest way to melt an ice cube? What is the best liquid to make the raisins dance? Which pop is the fizziest?	Living things and their habitats Does the amount of light affect how much a woodlice moves around?		Electricity Which materials are the best conductors?
Year 5	Animals including humans How does age affect reaction time?	Properties and changes of materials Skittles investigation Which paper daisy opens the fastest? Which type of sugar dissolves the fastest? At what temperature?	Earth and space Which cupcake case falls the fastest?		Forces What shape parachute takes the longest to fall?	
Year 6	Animals including humans Which biscuit makes the best dunker? Which form of exercise has the biggest impact on our heart rate?	Electricity Which brand of battery lasts the longest? Which type of fruit makes the best fruity battery?	Evolution & inheritance Does size and shape of a bird's beak affect what it will eat?	Light	Living things and their habitats What happens if you leave bread on the windowsill?	

A blue arrow pointing to the right, containing the text "Knowledge Organisers".

Knowledge Organisers

Key Vocabulary			
Branches	Parts that grow out of a tree trunk	Plant	A living thing that grows in the earth
Bulbs	A root shaped like an onion that grows into a flower/plant	Roots	The parts of a plant that grow under the ground
Common	Something found in large numbers / happens often	Seed	The small hard part from which a new plant grows
Flower	The part of a plant which is often brightly coloured and grows out the stem	Stem	The thin upright part of a plant on which the flowers and leaves grow
Flowering	Trees or plants which produce flowers	Tree	A tall plant that has a hard trunk, branches and leaves
Fruit	Grows on a tree/bush and contains seeds/stones	Trunk	The large main stem from which branches grow
Garden	A piece of land next to a house	Vegetable	Plants like cabbages, potatoes, onions...
Herb	A plant whose leaves are used in cooking for flavour or medicine	Vegetation	Plants, trees and flowers
Leaf/leaves	Flat, thin and usually green	Weed	A wild plant that grows in gardens and can prevent other plants growing properly
Petal	Thin coloured parts which form part of a flower		

Plants

Overview










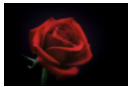


A plant is one of a large group of living things that use sunlight to make their own food. Most plants have leaves, stems, roots and either flowers or cones.

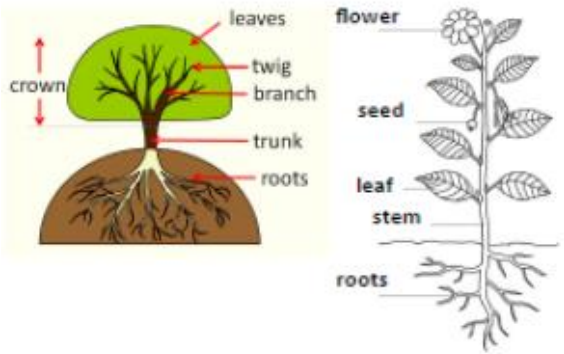
Trees are tall, woody plants. They usually have a stem called a trunk. Trees can be deciduous (leaves turn brown and fall off in autumn). Or trees could be **evergreens**, they seem green year round.



Deciduous

evergreen

Common plants			
dandelion		poppy	
Daisy		daffodil	
buttercup		pansy	
nettle		tulip	
clover		Rose	
sunflower		bluebell	



Animals including humans

Key Vocabulary

senses	To understand and recognise something using sight, smell, touch, hearing and taste.
skeleton	The frame of bones that support a human or animals body.
external	Something that is on the outside.
internal	Something that is on the inside.
carnivore	An animal that eats meat.
herbivore	An animal that eats plants.
omnivore	An animal that eats both meat and plants.
habitat	The natural environment where a plant or animal lives.

Overview





















Animals are living things. Like plants, **animals** need food and water to live. Unlike plants, which make their own food, **animals** feed themselves by eating plants or other **animals**. Animals can also sense what goes on around them. Their bodies allow them to move in reaction to their surroundings. They use their senses and movement to find food, mates, and safety.

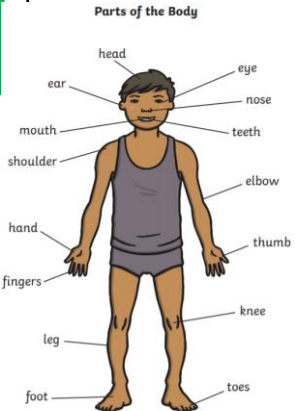
Millions of different kinds of animals live on Earth. Animals are found throughout the world, from the freezing polar zones to the hottest deserts. They live on land and in the water. They come in a huge variety of shapes and sizes.

Birds, reptiles, fish, amphibians, mammals, insects, snails, and worms are some of the major kinds of animals.

Animal comes from a Latin word that means "a breathing thing."

Varieties of common animals

Fish	An animal which lives in water and is covered in scales.	<div>goldfishtunasharkeel</div>
Amphibians	An animal that lives on both land and in water.	<div>frogtoadnewtsalamander</div>
Reptiles	An animal that produces eggs and uses the heat of the sun to keep it warm.	<div>snaketortoiselizardalligator</div>
Birds	A creature with feathers and wings and is usually able to fly.	<div>penguinchickenseagullrobin</div>
Mammals	An animal where the mother feeds its young from her own body.	<div>humanmousedogcow</div>



The 5 Senses



Materials

Key Vocabulary

Hard	Not easily broken or bent.
Soft	Easy to cut, fold or change shape of.
Transparent	It can be seen through.
Opaque	It cannot be seen through.
Bendy	It can be pulled and moved easily without breaking.
Stretchy	Can be pulled to make it longer or wider without breaking.
Stiff	Cannot be pulled to make it longer or wider without breaking.
Waterproof	It does not allow water to go through.
Absorbent	It soaks up water easily.
Shiny	Reflects light easily.
Dull	Doesn't reflect light.
Rough	It feels and looks bumpy or uneven.

Materials

Glass



Wood



Plastic



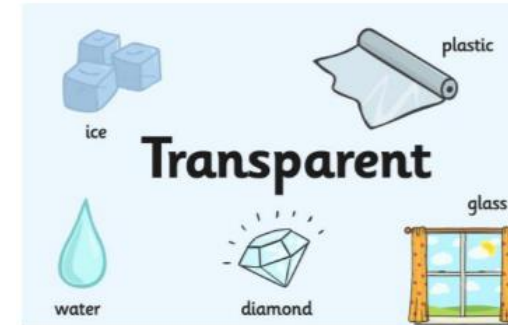
Metal



Water



Rock



Materials

Overview

Materials are the “stuff” that things around us are made of.

Properties of materials

These are what makes a material what it is. It is usually what we can feel, touch or see. For example we can describe a metal tin as being round, sharp, rough, opaque and dull from what we can see and feel when we touch it.





Uses of materials

Because of their properties, different materials are suited to different uses. E.g. you wouldn’t want a window made of wood... you wouldn’t be able to see through it! Some materials can be manipulated and changed depending on how you mould them.

Key Vocabulary

Translucent	A material that allows some light to pass through it
suitable	being fit or right for a use or group
unsuitable	Inappropriate for use
Rigid	Unable to be bent out of shape
Flexible	Pliable and easily bent

Where this links in our curriculum: This will build upon the materials work children have completed in Year 1. In year 2, the children will identify and compare the suitability of a variety of everyday materials for particular uses and find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

 <p>Squash an object by pushing both hands together.</p>	 <p>Bend an object by grabbing both ends of the object and bringing the ends inwards together.</p>	 <p>Twist an object by turning your hands in opposite directions.</p>	 <p>Stretch an object by pulling your hands slowly and gently apart.</p>
squashing	bending	twisting	stretching
Pressing, squeezing and crushing so that something becomes flat or changed into a different shape. We might use this when we are baking or using clay.	Changing something that is straight into a curve or at an angle. We might use this when we are bending a wire.	Make into a curled shape by holding and move round in different directions at the same time. We might use this with a piece of paper or material.	Pulling something to make it wider or longer without tearing. We might use this to flatten something out or when making pizza dough.

Material	Properties	Uses
Wood	strong, opaque, stiff, hard	Chairs, tables, furniture
Plastic	bendy, smooth, translucent, stretchy	Window frames, food packaging
Glass	transparent, hard, smooth, waterproof	Windows, bottles, kitchen utensils
Brick	rough, strong, opaque, dull	Walls and building work
Paper	translucent, flexible, not waterproof	Books, notepads
Cardboard	rough, dull, opaque, not waterproof	Food packaging,
Metal	Shiny, strong, opaque, hard	Food packaging, table legs, nails and screws
Rock	Rough, strong, opaque, hard	Worktops, houses, concrete



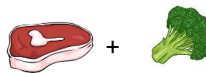


What Can Be Recycled?

- Paper and Cardboard - such as newspaper and cardboard boxes
- Plastic – such as yoghurt pots and milk bottles
- Metal – such as cans
- Glass – such as bottles and jars
- Clothes – such as jumpers and trousers
- Garden Waste - such as grass cuttings
- Food – such as apple cores and leftovers




Living things and their habitats – Which habitats do worms prefer?


Habitat	A natural home in which plants and animals live.
Micro-habitat	A very small habitat within a habitat.
Food chain	How plants and animals are linked through what they eat.
Herbivore	
Carnivore	
Omnivore	

Types of Micro- habitat


Log



Path




Bush




Types of Habitat


Mountains




Woodland




Sea Shore




Ocean




Savannah/Grassland




Desert



Rainforest



Polar









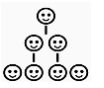

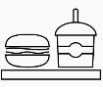
Alive

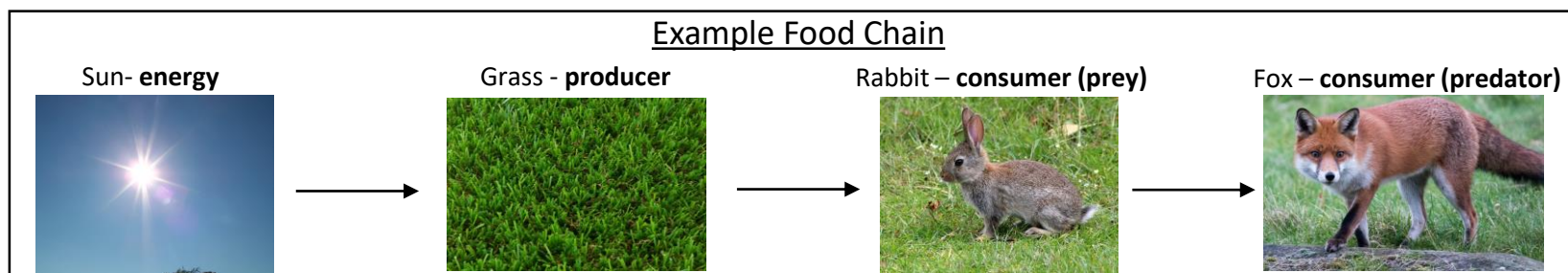


Never alive







Dead

M	Movement	
R	Respiration	
S	Sensitivity	
G	Growth	
R	Reproduction	
E	Excretion	
N	Nutrition	



Key Vocabulary	
Hard	Not easily broken or pierced
Smooth	An even surface
Absorbent	Able to soak up liquid
Rough	Uneven, raised patches
Transparent	A material you can see through
Translucent	A material that allows some light to pass through it
Opaque	Objects which create a strong shadow when light is shone at them
Dull	Lacking in shine or brightness
Rigid	Unable to be bent out of shape
Flexible	Pliable and easily bent
Waterproof	Expels water and liquids

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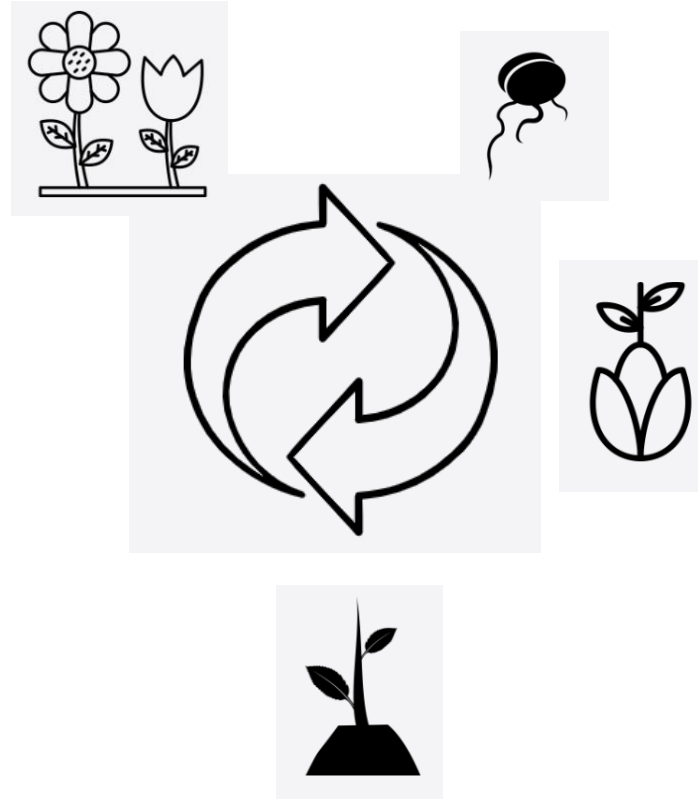
Plants

Key Vocabulary

Root	Anchor the plant in the ground and absorb water and nutrients from the soil.
Stem	Transports water and nutrients to different parts of the plant.
Leaves	The place where photosynthesis takes place.
Petals	The separate leaves that form the outside part of a flower head and usually attract insects.
Flower	The part of a plant which allows it to reproduce.
Seed	Produced the fertilisation ovule, seeds allow a plant to reproduce.
Nutrients	A substance that provides nourishment for growth. All living things need nutrition.
Transportation	The movement of things from one place to another
Pollination	The process in which pollen is taken from one plant or part of a plant to another so that new plant seeds can be produced
Dispersal	The action of spreading across or moving away over a large area

Overview

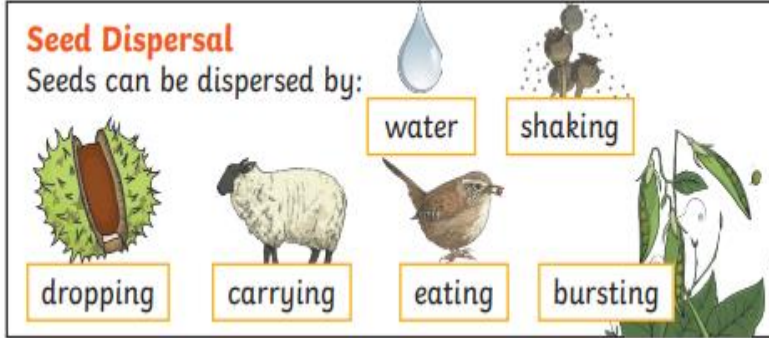
All parts of plants are important and carry out different functions. All of them come together to perform their respective functions for the healthy life of the plant.



Key Information

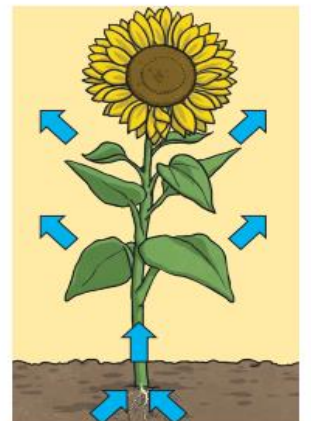
Seed Dispersal

Seeds can be dispersed by:










How Water Moves through a Plant

1. The **roots** absorb water from the soil.
2. The **stem** transports water to the **leaves**.
3. Water **evaporates** from the **leaves**.
4. This **evaporation** causes more water to be sucked up the **stem**.



The water is sucked up the **stem** like water being sucked up through a straw.








Key Vocabulary

Healthy	In a good physical and mental condition.	
Nutrients	Substances that animals need to stay alive and healthy.	
Vertebrate	Animals with backbones.	
Invertebrate	Animals without backbones.	
Muscles	Soft tissues in the body that contract and relax to cause movement.	
Joints	Areas where two or more bones are fitted together.	
Skeleton	An internal or external framework supporting or containing the body of an animal or plant.	
Endoskeleton	Skeletons that are inside the body of creatures are called endoskeleton	
exoskeleton	Some animals, such as insects, crabs and lobsters, have a skeleton outside their body. Such skeletons are called exoskeletons .	
Hydrostatic skeleton	A hydrostatic skeleton , or hydroskeleton, is a flexible skeleton supported by fluid pressure.	

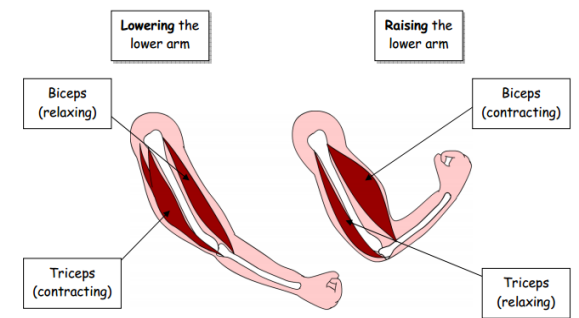
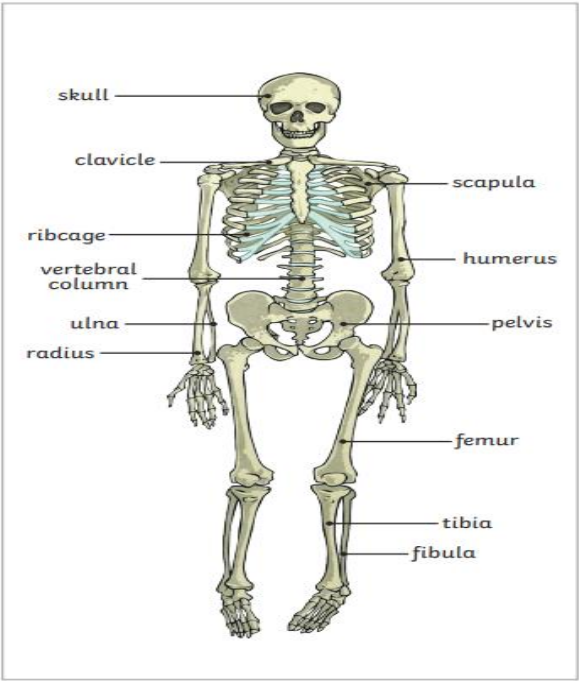
Animals, including humans

Our skeleton supports our body weight to help us stand and move. Joints, connective tissue and muscles work together to make our body parts mobile. Muscles enable us to be active and exercise. The heart is the strongest muscle in our body.

- Skeletons do three important jobs:
- protect organs inside the body;
 - allow movement;
 - support the body and stop it from falling on the floor.

Nutrient	Found in... (examples)	What it does/they do
carbohydrates		provide energy
protein		helps growth and repair
fibre		helps you to digest the food that you have eaten
fats		provide energy
vitamins		keep you healthy
minerals		keep you healthy
water		moves nutrients around your body and helps to get rid of waste

Key Information




Rocks

Key Vocabulary

Igneous rock	Rock that has been formed from magma or lava
Sedimentary rock	Rock that has been formed by layers of sediment being pressed down hard and sticking together.
Metamorphic rock	Rock that started out as igneous or sedimentary but changed due to being exposed to extreme heat.
Magma	Molten rock that remains underground.
Lava	Molten rock that comes out of the ground is called lava.
Sediment	Natural solid material that is moved and dropped off in a new place by water or wind e.g. sand.
Permeable	Allows liquid to pass through it.
Impermeable	Does not allow liquids to pass through it.
fossilisation	The process by which fossils are made.
Paleontology	The study of fossils.
Erosion	When water, wind or ice wears away land.

Overview






Rocks are made of one or more minerals. There are three main classifications of rock, based on the way the rock was formed: sedimentary, metamorphic and igneous. Soil is formed of fine rock particles mixed with air, water and particles from dead plant and animal matter. There are three main types of soil which are classified according to the amount of sand and clay in them.

IGNEOUS		SEDIMENTARY		METAMORPHIC	
					
Granite	Scoria	Sandstone	Limestone	Marble	Slate
					
Pumice	Obsidian	Shale	Conglomerate	Quartzite	Gneiss



Mary Anning was an English fossil collector, dealer, and paleontologist who became known around the world for important finds she made in Jurassic marine fossil beds in the cliffs along the English Channel at Lyme Regis.

Fossilisation

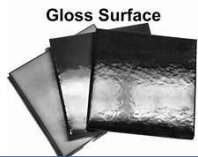
An animal dies. It gets covered with sediments which eventually become rock.	More layers of rock cover it. Only hard parts of the creature remain, e.g. bones, shells and teeth.	Over thousands of years, sediment might enter the mould to make a cast fossil . Bones may change to mineral but will stay the same shape.	Changes in sea level take place over a long period.	As erosion and weathering take place, eventually the fossil becomes exposed.
				

Light

Key Vocabulary

light	A type of energy. We need light to see. Light comes from different light sources.
light source	An object that makes its own light. Our main natural light source is the sun.
dark	Dark is the absence of light.
reflection	The process when light hits the surface of an object and then that light travels to our eyes so we can see.
spectrum	A range of colours which is produced when light passes through a glass prism or water. A rainbow shows the colours in the spectrum.
pupil	The black part of the eye which lets light in.
retina	A layer at the back of the eye that takes the light the eye receives then changes it into nerve signals to send to the brain.
shadow	An area of darkness where light has been blocked.
opaque	Describes objects that do not let any light pass through them.
translucent	Describes an object that let some light through, but scatter the light so we can't see through them properly.
transparent	Describes objects that let light travel through them easily, meaning that you can see through the object.

Shiny surfaces reflect light well



spectrum



Shadows

An opaque object blocks the light from going through. A dark shape is formed called a shadow.



Shadows change depending on the distance the object is from the light source and the position of the light source.



Key Information

Light travels in a straight line and travels faster than sound.

A light year is a unit of measurement for distance. It is the distance light can travel in a year.

The moon does not emit its own light – it reflects the sun.

Ultraviolet (UV) light is type of radiation which you can't see but can be dangerous. UV rays come from the sun.

The pupils control the amount of light entering the eye



Key Vocabulary

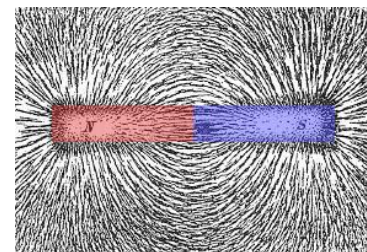
Force	A push or a pull
Friction	A force that acts between two surfaces or objects that are moving, or trying to move across each other.
surface	The top layer of something.
Magnet	An object which produces a magnetic force that pulls certain objects towards it.
magnetic	Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic.
Magnetic field	The area around a magnet where there is a magnetic force which will pull magnetic objects towards the magnet.
Poles	North and south poles are found at different ends of a magnet.
Repel	Repulsion is a force that pushes objects away. E.g. when a north pole is placed near a north pole of another magnet, the two poles repel each other.
Attract	Attraction is a force that pulls objects together. E.g. when a north pole is placed near the south pole of another magnet the two poles attract.

Where this links in our curriculum: It builds on work in history in KS1- "The space race".

Forces and Magnets

Overview

A force is a push or a pull. Forces can change an object's speed, its direction, and even its shape. Pushing a door open, pulling it closed, stretching a rubber band—all of these actions require force. Magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary.



A magnetic field is invisible. You can see the magnetic field here though. This is what happens when iron filings are placed on top of a piece of paper with a magnet underneath it.

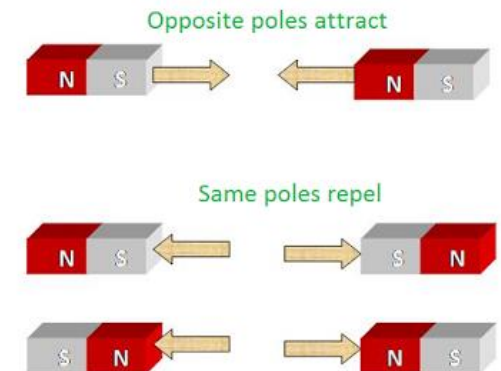
Key Information

All forces can be thought of as a push or a pull or all forces can be thought of as attracting or repelling. Forces can cause movement and change of shape. They can also act on objects without causing movement or change of shape.

Weight is a force, mass is the amount of matter. On the moon, your mass is the same, but your weight will be different because the amount of gravity acting on you is different. Less gravity means less weight, but it will not affect your mass.

Forces can be measured in Newtons.

Force meters contain springs that stretch in proportion to the force being measured.



Key Vocabulary

food chain	A series of animals (organisms) that are linked by what they eat.
carnivore	An animal that eats meat.
herbivore	An animal that eats plants.
omnivore	An animal that eats both plants and other animals.
predator	An animal that hunts and eats prey animals.
prey	An animal that is eaten by other animals.
producer	Plants in a food chain.
consumer	Animals that eat plants in a food chain.
digest	Break down food so that it can be used by the body.
incisors	Teeth that are used for biting and cutting food.
canines	Teeth that are used for tearing and ripping food.
premolars	Teeth that are used to hold and crush food.
molars	Teeth that are used to grind food.
wisdom teeth	Third set of molar teeth that are no longer required by humans.
oesophagus	A muscular tube which forms the path from the mouth to the stomach.
small intestine	Absorbs nutrients from food.
large intestine	Absorbs water from waste food and transports the waste for the body to get rid.
stomach	An organ in the body where food is digested.
enzymes	These are chemical reactions that help break down food in our body.

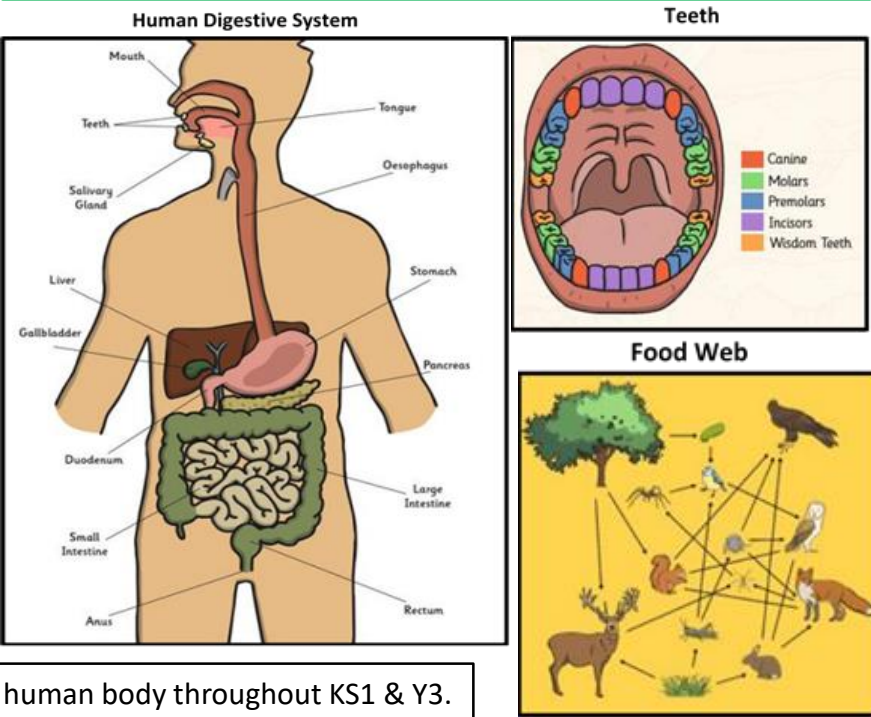
Where this fits in our curriculum: This builds on work on the human body throughout KS1 & Y3. The digestive system builds on the knowledge of the skeletal and muscular systems in year 3.

Animals Including Humans

Overview

Ecosystems
All animals, including humans live within a delicate ecosystem, which provides us with the food we need to survive. These ecosystems can be shown through food chains and food webs which allow us to see the passing of energy from one living organism to another.

Digestive System
Our Digestive System is the process by which we eat and store food ready to be used as energy. The digestion of food starts with the mouth and the different jobs that our teeth do, before moving through other parts of our internal organs.

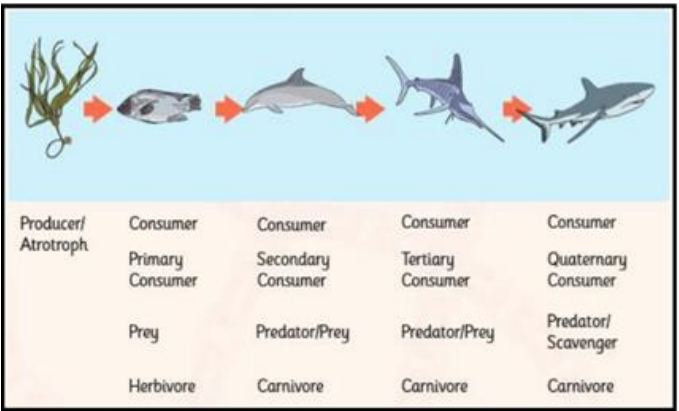


Key Information

Stages of the Digestive System:

1. Chewing	When you chew your food it breaks up big pieces into little pieces that are easier to digest and swallow by using enzymes in your saliva.
2. Swallowing	Our tongue helps to push food into the back of our throat, then special muscles force it down the oesophagus until it gets to the stomach.
3. Stomach	More enzymes break down the food into things our body needs. The stomach kills a lot of bad bacteria as well, so we don't get sick.
4. Small Intestine	Works to continue to break down our food and then the food is absorbed from the intestine into our body through the blood.
5. Large Intestine	Any food that the body doesn't need or can't use is sent to the large intestine and later leaves the body as waste.

Food Chain



Electricity

Key Vocabulary

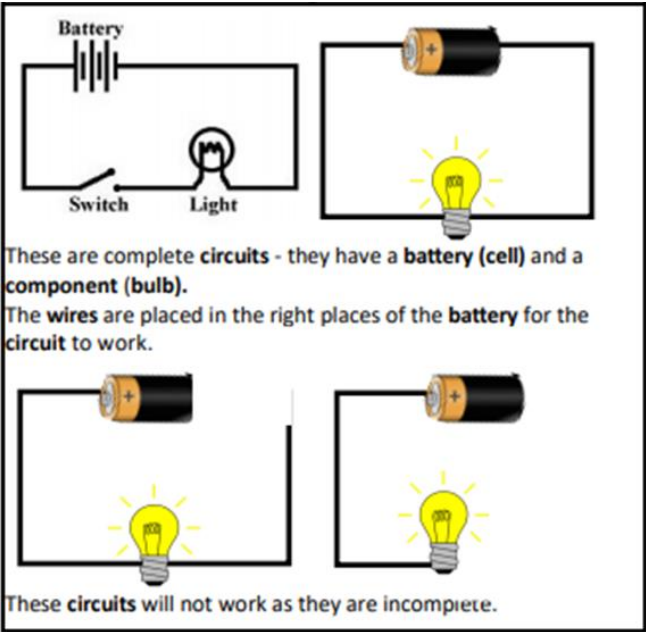
electrical component	A device that requires electricity to work and is used to build circuits.
circuit	A set of electrical components connected by wires. Can be either complete or incomplete.
battery (cell)	Portable devices that store and provide electricity.
bulb	Electrical component that produces light.
switch	Electrical component that is used to switch circuits on and off.
buzzer	Electrical component that produces sound.
wire	Thin strips of metal which conduct electricity.
electrical conductor	Material that allows electricity to flow through it.
electrical insulator	Material that prevents electricity from flowing through it.
circuit diagram	Drawing showing the electrical components that make up a circuit.
energy	The power from sources such as electricity that makes machines work or provides heat.

Where this fits in our curriculum:

This is an introduction to electricity exploring simple electrical circuits and children will be taught about keeping safe when working with electricity.
This unit of work is built upon in Y6.

Overview

All electrical appliances are created by a series of components joined together in a circuit, but we often don't see them because they are incredibly small and usually encased in something. We know that for a circuit to be working it must always have a cell(battery) and connecting wires. If at any stage the electrical appliance isn't working, then there must be a break in the circuit where the electrical current can no longer pass.



Key Information

Common appliances that use electricity:



Some appliances use batteries and some use mains electricity.

Batteries come in different sizes depending on how much and for how long the appliance is used.

Some appliances can also generate their own electricity using solar power, like garden lights.



Electrical Components - Physical

Electrical Conductors	Electrical Insulators
Copper	Rubber
Iron	Wood
Steel	Plastic
Silver	Paper
Gold	

Key Vocabulary

amplitude	A measure of the strength of a sound wave.
decibel	A measure of how loud a sound is.
frequency	A measure of how many times per second the sound wave cycles.
Instrument	There are five key families of instrument: brass, keyboard, percussion, string and woodwind.
Insulate	The process of muffling the volume of sound.
pitch	How high or low a sound is.
power	Power is energy, especially electricity, which is obtained in large quantities from a fuel source and used to operate lights, heating, and machinery.
soundwaves	Invisible waves that travel through air, water, and solid objects as vibrations.
source	Where something comes from, e.g. a sound.
transmit	To pass from one place or person to another.
travel	How something moves around, e.g. sound.
vibrations	Invisible waves that move quickly from the source to our ear.
volume	How loud or quiet a sound is.

Where this fits in our curriculum:

This work builds on the work covered on the senses in key stage 1.

Sound

Overview

Sound is anything that can be heard and the object that makes that sound is referred to as the source. This sound is created by vibrations that are passed through the air around them until they reach your ear – these are called sound waves.

Sound travels in invisible waves through the air/water, etc... until it reaches the ear and can be heard. The brain recognises these vibrations as sound. Sounds can then be measured or evaluated in different ways.

Pitch:

High pitch sounds are created by short soundwaves.



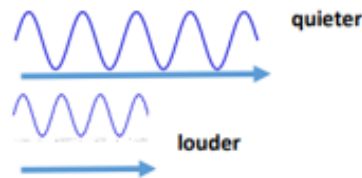
Low pitched sounds are created by long soundwaves.



Volume:

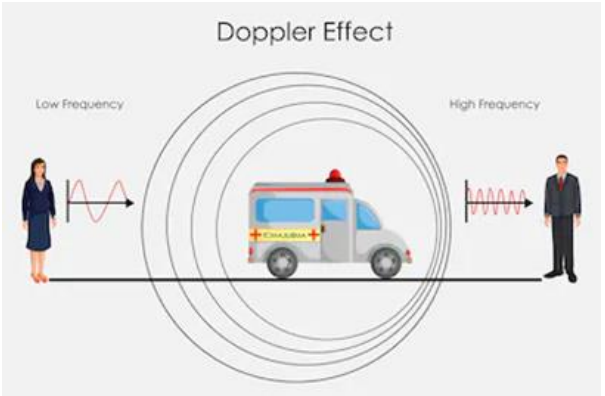
The closer you are to the source of the sound, the louder the sound will be.

The further away you are from the source of the sound, the quieter the sound will be.



Key Information

Question	Key Concepts
How do sounds change?	Pitch: The pitch of a sound is how high or low it is. A squeak of mouse has a high pitch. A roar of a lion has a low pitch. Volume: Volume of a sound is how loud or quiet it is. When a sound is created by a little amount of energy, a weak sound wave is created which doesn't travel far. This makes a quiet sound. A vibration with lots of energy makes a powerful sound wave and therefore a loud sound.
How do we measure sound?	Amplitude measures how strong a sound wave is. Decibels measure how loud a sound is. Frequency measures the number of times per second that the sound wave cycles.



The Doppler Effect is the idea that the frequency of a sound will be higher as you move closer to the source, but lower as you move further away.

Key Vocabulary

organism	An animal or a plant
habitat	Where an organism lives
characteristic	A property that something has
vertebrate	An animal with a backbone
invertebrate	An animal without a backbone that has an exoskeleton
backbone	Spine – a collection of bones forming a backbone
classify	To group together based on characteristics
environmental danger	Anything in a natural habitat that can cause harm to an organism
endangered species	Organisms that are at risk of becoming extinct
extinct	An organism is extinct when there are none of them left at all on Earth.

Where this links in our curriculum:

This unit of work builds on work on animals and their habitats and living things in Key stage One and Year 3.

Living Things

Overview

All animals and plants are living things.

Plants

- Plants need warmth, light, water and nutrients from the soil to survive.
- Plants reproduce through pollination, seed dispersal and seed formation.

Animals

- Animals and humans need nutrition to survive, they can't make their own so get nutrition from what they consume (eat and drink).
- Humans and some animals have skeletons and muscles for movement, protection and support.

Key Information

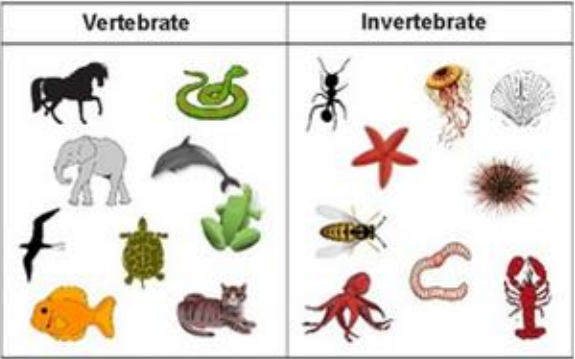
Did you know that all living things can be classified into different groups? Classification means sorting living things into groups based on their characteristics (the way they are). We can use the acronym of MRS GREN to help us classify animals in different ways.

Movement	The way that a living thing moves.
Respiration	The way that a living thing breathes (respires).
Sensitivity	How the living thing responds to their environment.
Growth	How the living thing grows, an irreversible change of mass.
Reproduction	How a living thing reproduces and creates another version of itself.
Excretion	How the living thing removes waste products.
Nutrition	Living things need food for energy and nutrients to survive.

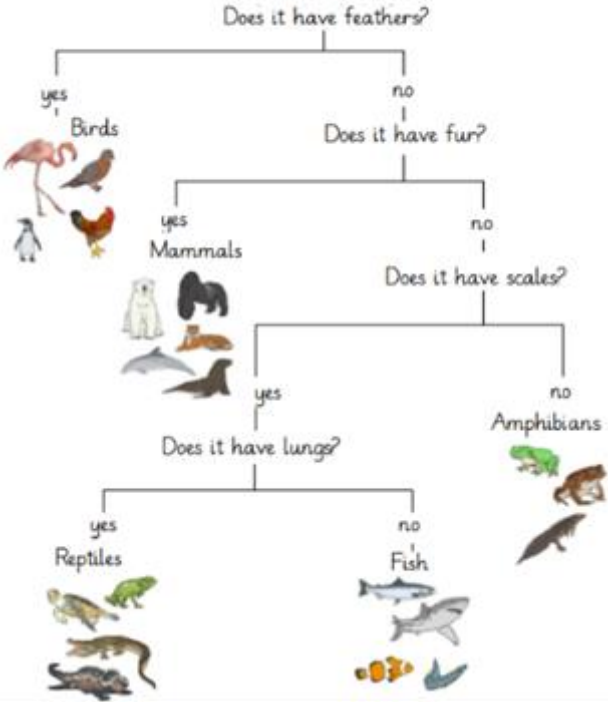
All living things can be classified into these categories:

Vertebrates	Any animal that has a backbone.
Invertebrates	Any animal that does not have a backbone.
Flowering Plants	Plants that produce flowers.
Non-flowering Plants	Plants that do not produce flowers.

Vertebrates and Invertebrates



Classification branching diagram



Key Vocabulary

solid	Materials that keep their shape unless a force is applied to them.
liquid	Materials that take the shape of the container that they are in and can flow and be poured.
gas	Materials that spread to completely fill the area that they are in. They do not keep their shape.
reversible change	A change that can be undone, e.g. water can be melted and frozen.
temperature	The measure of how hot or cold something is.
thermometer	Piece of equipment used to measure temperature.
Celsius	A unit used in measuring temperature °C
melting point	The temperature at which a solid melts and becomes a liquid.
freezing point	The temperature at which liquid becomes a solid.
Water Cycle	The on-going process where water moves around the Earth and changes state.
evaporation	The process where liquids change to a gas or vapour.
condensation	The process by which vapour changes back into liquid.
precipitation	The technical term for rain, sleet, snow or hail falling from the sky.
vapour	The gas phase of water.
particle	A very small piece of matter that make up solids, liquids and gases.

Where this fits in our curriculum:




This unit of work builds upon the work on materials in Key Stage 1 and explores the changing state of materials.

States of Matter

Overview

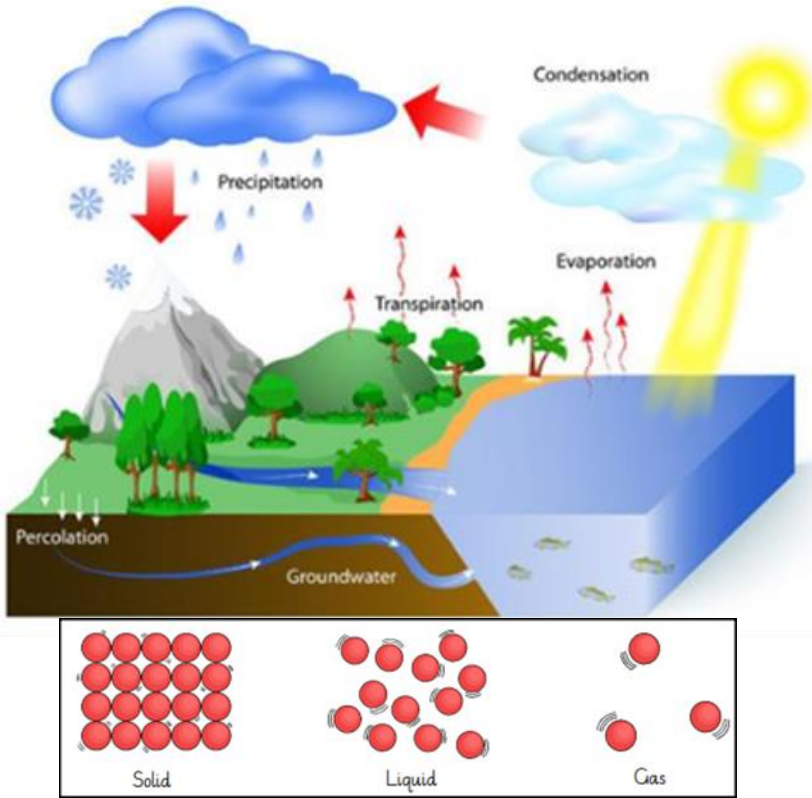
States of Matter are the different forms an object can take and consist of solids, liquids and gases. An object can change from one state to another if it is heated or cooled. A key example of this is water which can change from a liquid to a solid if it freezes or to a gas if it is boiled, becoming vapour.

The most common place where this occurs naturally is in our water cycle, which is the process by which we get rain.

solid	liquid	gas
		
● rigid	● not rigid	● not rigid
● fixed shape	● no fixed shape	● no fixed shape
● fixed volume	● fixed volume	● no fixed volume
cannot be squashed	cannot be squashed	can be squashed
Solid (at room temperature)	Liquid (at room temperature)	Gas (at room temperature)
Wood Iron Copper Plastic	water milk blood oil	oxygen carbon dioxide nitrogen steam

Key Information

Changing State	Matter can change from one state to another if it is heated or cooled. If ice (a solid) is heated it changes to water (a liquid). This change is called melting. If water is heated, it changes to steam (a gas).
The Water Cycle	The water cycle is the complete journey that water makes, from one place to the other, and from one state to the other. As the word 'cycle' suggests, there is no starting point. This means that we can begin at any point and follow its path until it gets to where we started again.

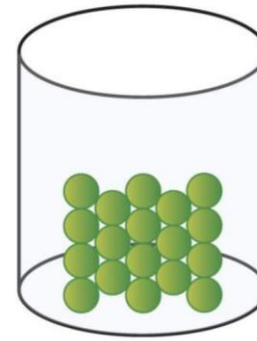


Science: Year 5 – Properties and Changes of Materials.

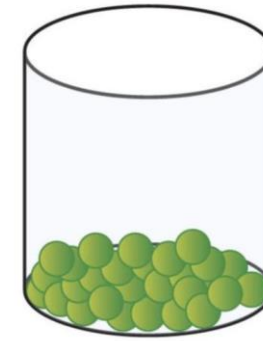
Key Vocabulary

transparent	Allows light to pass through so that objects behind can be seen.	opaque	Can't to be seen through, not transparent.
rigid	Unable to bend or be forced out of shape.	flexible	Capable of bending easily without breaking.
conductor	A material or device which allows heat or electricity to carry through.	Insulator	A substance which does not readily allow the passage of heat or sound.
magnetic	Capable of being magnetised or attracted by a magnet.	thermal	Relating to heat.
states of matter	Different types of matter – solid, liquid or a gas.	solid	Firm and stable in shape, not a liquid or fluid.
liquid	A substance that flows freely but can be measured by volume e.g. water or oil .	gas	An air-like fluid substance which expands freely to fill any space available.
reversible	Able to be reversed back to its original state.	irreversible	Cannot be reversed back to its original state.
evaporation	The process of turning from liquid to vapour.	dissolve	When something solid mixes with a liquid and becomes part of the liquid.
soluble	Able to be dissolved, especially in water.	solution	solvent + solute
solute	A solid that can dissolve in a liquid	solvent	A liquid which will dissolve a solid

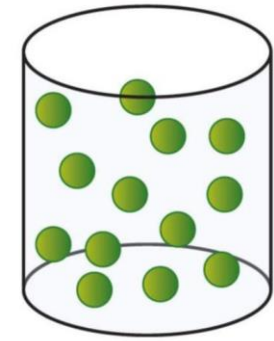
States of matter



Solid



Liquid



Gas

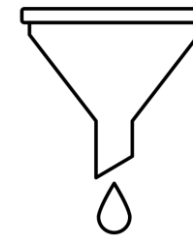
Reversible changes



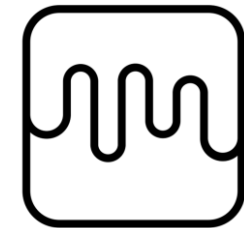
Evaporating



Sieving



Filtering



Melting



Dissolving

Science: Year 5 – Living Things and Their Habitats

Key Vocabulary

amphibian	A cold-blooded vertebrate animal that compromises frogs, toads, newts and salamanders.	insect	A small animal that has six legs and generally one or two pairs of wings.
mammal	A warm-blooded vertebrate animal with hair or fur, females provide milk for young and typically giving birth to live young.	bird	Warm-blooded egg-laying vertebrate animal distinguished by the possession of feathers, wings, a beak and typically able to fly.
vertebrate	An animal with possession of a backbone/ spinal column.	invertebrate	An animal lacking a backbone.
habitat	The natural home or environment of an animal, plant or other organism.	life cycle	The series of changes in the life of an organism including reproduction.
asexual reproduction	Offspring get genes from one parent so are clones of their parents.	sexual reproduction	Offspring get genes from both mum and dad, inheriting a mix of features from both.
metamorphosis	The process of transformation from an immature form to an adult form in two or more distinct stages.		

Overview

There are many different classes of animal. Those with backbones are known as the 'class', **vertebrates**. These are then grouped into: mammals, birds, fish, reptiles and amphibians.

- **Invertebrates**, animals without backbones, are arachnids, insects, snails, slugs and worms.

- Humans fall into the **mammal** class as they have hair on their bodies and drink milk when they are babies. Whales, dolphins, bats, cats, dogs and hedgehogs are also mammals.

- A **habitat** is the non living environment surrounding a living thing. It provides space, shelter, food and water.

Key Information

Reproduction in plants

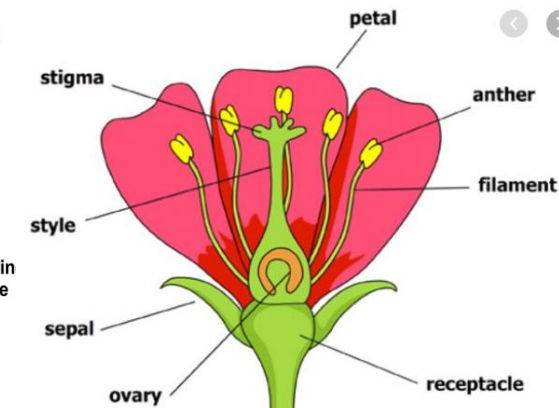
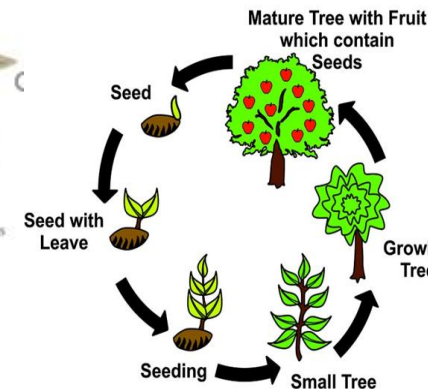
Pollen is carried by insects or blown by the wind from one flower to another. The pollen travels to the ovary where fertilisation occurs and seeds are made. Seeds are dispersed by animals or the wind and some seeds will grow into new plants.

Reproduction in Animals

For most animals which live on the land, offspring are fertilised inside the mother's body.

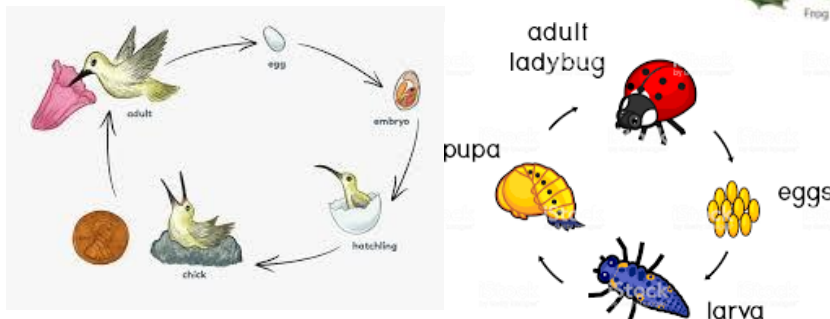
This happens in 1 of 3 ways:

- 1) The young develop inside the female and are born alive (most mammals).
- 2) Fertilised eggs are laid outside the female's body and develop in the egg getting nourishment from the yolk.
- 3) In some animals the eggs are held within the female and hatch as they are laid e.g. a fruit fly.



Where this links in our curriculum:

This unit of work builds on previous work on plants, animals, living things and their habitats in Key Stage 1, and lower key stage 2. It looks at lifecycles and reproduction in plants and animals.



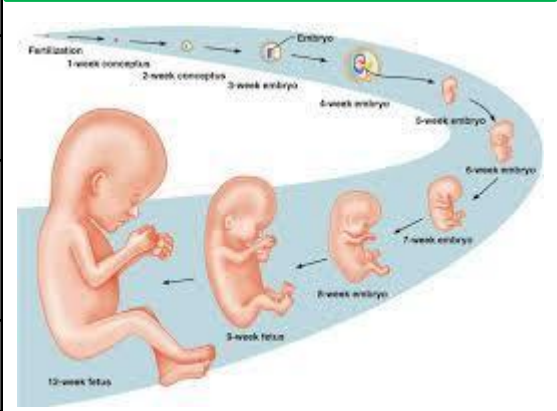
Science: Year 5 – Animals, Including Humans.






Key Vocabulary			
child	A young human being below the age of puberty.	adolescent	The process of development between a child and an adult (teenager).
adult	A person who is fully grown or developed.	puberty	The process of physical change through which a child's body matures.
conception	The point at which an egg is fertilised.	gestation	The process of developing inside the womb between conception and birth.
foetus	An unborn or unhatched offspring of a mammal.	embryo	An unborn offspring in the initial stages of development after fertilisation.
reproduction	The production of offspring by a sexual or asexual process.	fertilisation	The process in which male and female genes combine, allowing life to begin.
sexual reproduction	Offspring get genes from both mum and dad, inheriting a mix of features from both.	asexual reproduction	Offspring get genes from one parent so are clones of their parent.
life expectancy	The average period that you may expect to live.	offspring	A person's child or children/ an animal's young.

Overview

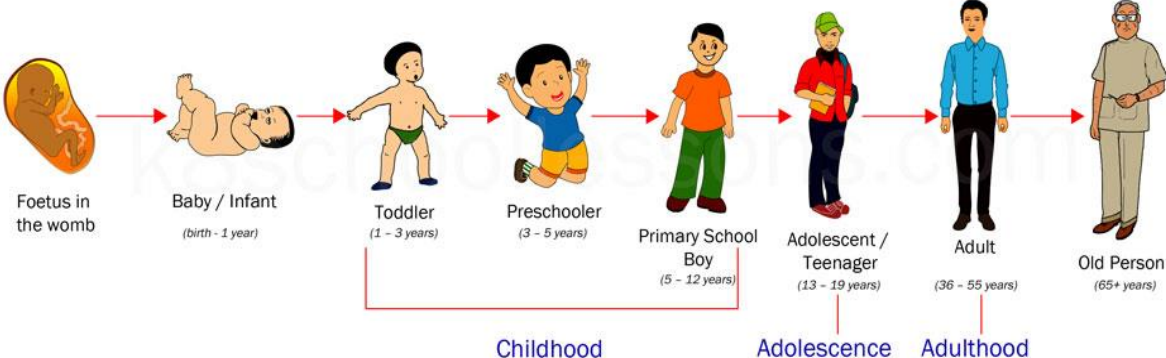
The human lifecycle is the process of change and development from birth through to old age. A human will pass through 8 stages: embryo, foetus, newborn, child, adolescent, young adult, middle-aged adult and old age.

All animals go through a life-cycle but in a different way.



Key Information			
Animals	Gestation period	Sexual maturity	Life expectancy
Humans 	9 months	11 – 17 years	80 years
House Mice 	20 days	4 – 6 weeks	1 year
African Elephants 	22 months	10 – 12 years	60 years
Saltwater Crocodiles 	2 – 3 months	10 – 12 years	70 years
Blue Whales 	10 – 12 months	10 years	90 years

Where this links in our curriculum:
This unit of work builds on the work undertaken on humans in KS1 and lower KS2. It begins to look at the reproductive system and links with Relationships and Sex Education in the PSHE curriculum.



Science: Year 5 – Earth and Space.

Key Vocabulary			
star	A burning mass of gas that makes heat and light energy (E.g. the Sun).	planet	An astronomical object that orbits a star and does not emit its own light.
Solar System	A star with objects (such as planets) revolving around it.	gravity	The force that attracts an object towards a larger object.
orbit	A curved path of a planet, satellite or spacecraft around an object such as the sun due to the attraction of gravity.	galaxy	An extremely large group of stars and planets that extends over many billions of light-years, held together by gravity (E.g. Milky Way and Andromeda).
universe	All of space and everything in it (including stars, planets and galaxies).	satellite	An object either natural (E.g. a moon) or man-made, that orbits around a planet.
light-year	The distance light travels in a year (≈9.46 trillion km).	vacuum	A space with no air.
asteroid	Irregularly shaped rock that orbits the sun, mostly occurring in the asteroid belt.	meteor	A mass of rock that burns after entering the Earth's atmosphere (meteorite when the rock has cooled on Earth) .
comet	A mass of ice and dust that has a long, luminous tail of gas.	astronomy	The branch of science that deals with space and the physical universe as a whole.









Where this links in our curriculum: This builds on work in history in KS1 “The Space Race” It also links with the work on forces covered in science in year 3.

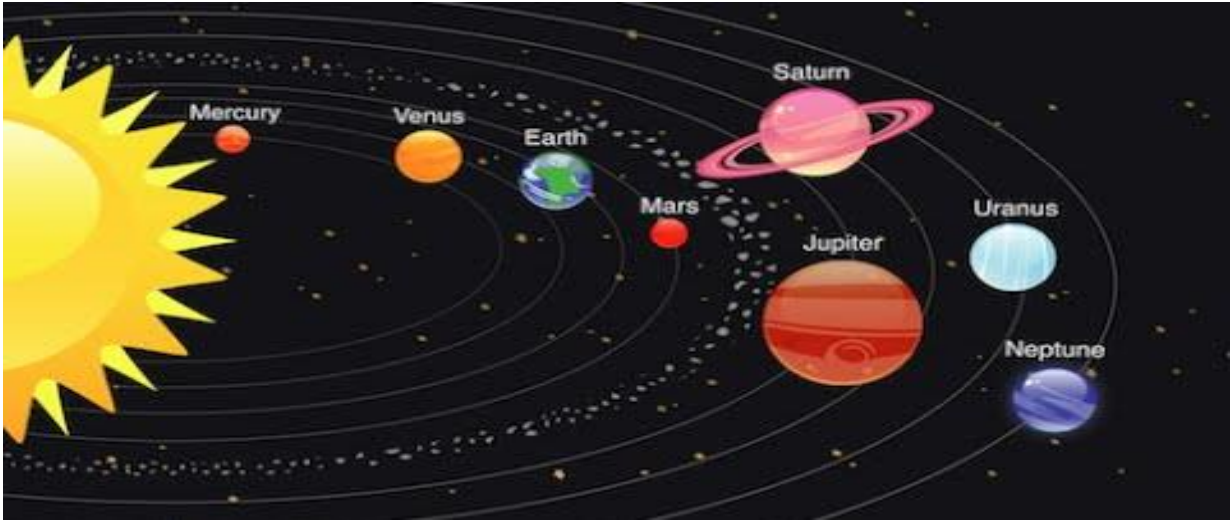
Overview

The Universe is everything we can touch, feel, sense, measure or detect. It includes living things, planets, stars, galaxies, dust clouds, light, and even time.

The Universe contains billions of galaxies, each containing millions or billions of stars. The space between the stars and galaxies is largely empty.

Within the galaxies is our solar system. At the centre of our solar system is the Sun. Around the Sun orbit eight planets, as well as stars, bits of dust, comets and meteoroids. We live in a spiral galaxy known as the Milky Way.

Key Information			
It takes our Moon about 29.5 days to completely cycle through all eight phases. This is known as a Lunar month.			
	1 – New moon		5 – Full moon
	2 – Waxing Crescent		6 – Waning Gibbous
	3 – Waxing Quarter		7 – Waning Quarter
	4 – Waxing Gibbous		8 – Waning Crescent



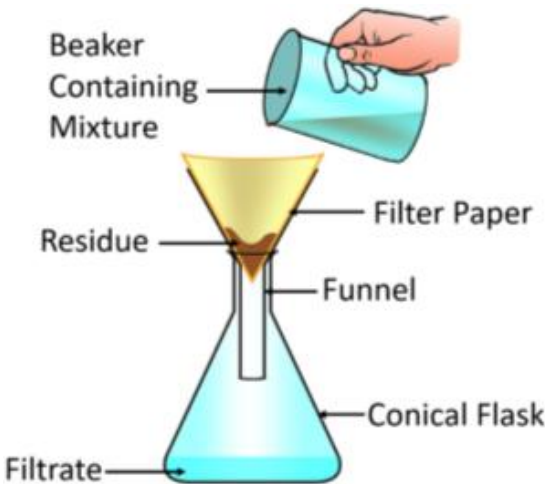
Science: Year 5 – Properties and Changes of Materials.

Key Vocabulary	
conductor	A material or device which allows heat or electricity to carry through.
liquid	A substance that flows freely but can be measured by volume e.g. water or oil .
thermal	Relating to heat.
separate	
soluble	Able to be dissolved, especially in water.
Insulator	A substance which does not readily allow the passage of heat or sound.
gas	An air-like fluid substance which expands freely to fill any space available.
irreversible	Cannot be reversed back to its original state.
dissolve	When something solid mixes with a liquid and becomes part of the liquid.
states of matter	Different types of matter – solid, liquid or a gas.

Overview

Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency. For example a bucket is made of plastic as it is durable and waterproof.

Depending upon a materials characteristics, it is possible that some can make reversible and irreversible changes.



Where this links in our curriculum: This builds upon the work undertaken in KS1 on grouping and classifying materials and the work in Y4 on states of matter. It also links with work in the food technology curriculum observing how foods change when heated.

Key Information			
<u>Reversible changes</u>	evaporating	The liquid changes into a gas, leaving the solid particles behind.	
	filtering,	The solid particles will get caught in the filter paper but the liquid will be able to get through.	
	sieving,	Smaller particles are able to fall through the holes in the sieve, separating them from larger particles.	
	melting	A physical process in which a solid turns into a liquid when heat is added.	
	dissolving	A solution is made when solid particles are mixed with liquid particles.	Materials that dissolve are soluble e.g. sugar.
			Materials that won't dissolve are insoluble e.g. sand
<u>Irreversible changes</u>	Often result in a new material being made.	Burning, rusting and combining different materials create an irreversible change.. E.g adding vinegar and bicarbonate of soda.	

Key Vocabulary

force	A push or pull upon an object resulting from its interaction with another object.		
pull force	To draw or haul towards oneself or itself, in a particular direction.	push force	To move something in a specific way by exerting force.
attraction	Pull force between two objects. ie feet on the ground	repulsion	The push force between two objects. ie magnets
mass	A measure of the amount of matter in a body/object. Mass just has size. Measured in g , kg	Weight (gravity)	The pull (gravitational force) that a body feels towards the centre of the Earth. It has size and direction. Measured in Newtons.
resistance	The ability to withstand a force.	mechanism	A system of parts working together in a machine.

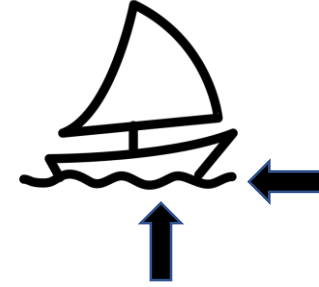
Types of forces



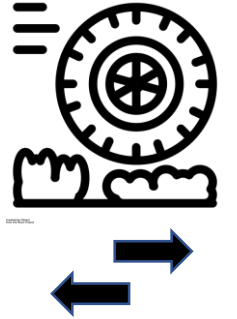
Gravity



Air Resistance

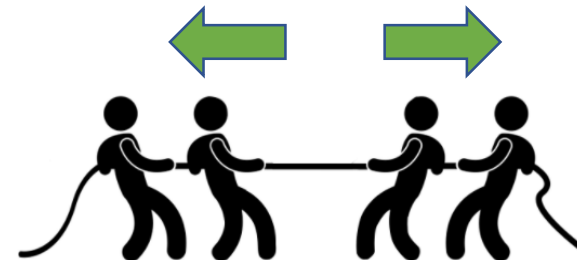


Water Resistance

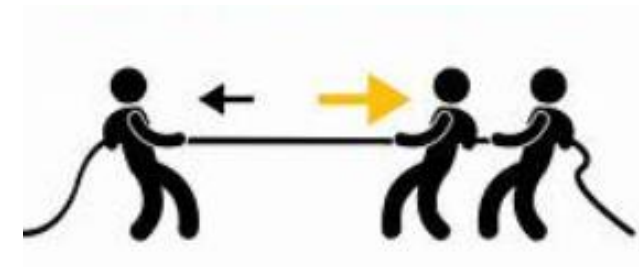


Friction

Balanced Force



Unbalanced Force



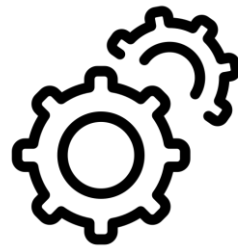
Mechanisms



Pulley



Lever



Gears

Forces are measured in **Newtons** using a **Newton meter**.

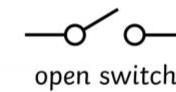
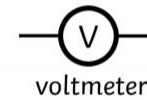
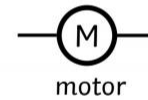
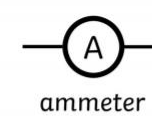
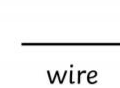
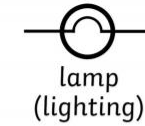
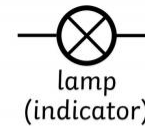
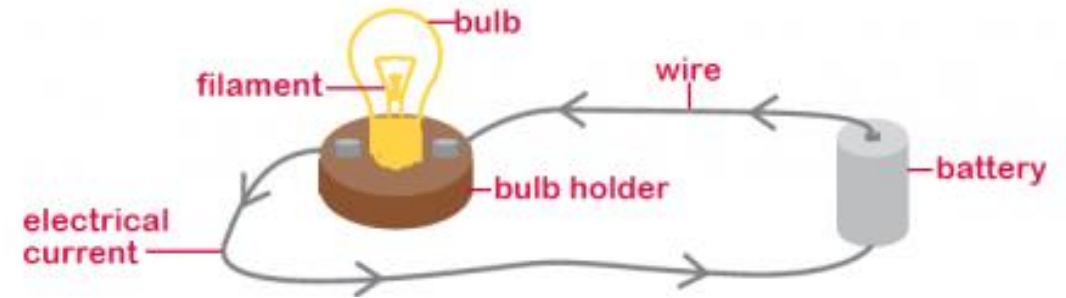


Key Vocabulary

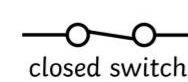
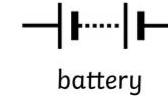
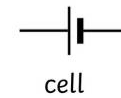
Battery	A container consisting of one or more cells where chemical energy is converted into electricity and used as a source of power
Bulb	A glass bulb which provides light by passing an electrical current through a filament
Buzzer	An electrical device that makes a buzzing noise and is used for signalling
Cell	A device containing electrodes that is used for generating current
Circuit	A complete and closed path around which a circulating electric current can flow
Conductor	A material or device which allows heat or electricity to carry through
Current	A flow of electricity which results from the ordered directional movement of electrically charged particles
Electricity	A form of energy resulting from the existence of charged particles
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 motive power for a vehicle or other moveable device
Switch	A device for making and breaking the connection in an electric circuit
Voltage	An electrical force that makes electricity move through a wire, measured in volts

Where this fits in our curriculum: This builds on the work on electricity undertaken in year 4 in science.

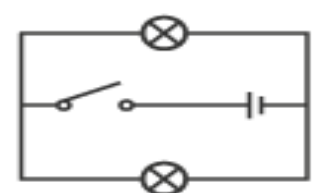
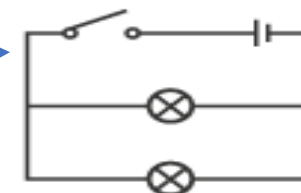
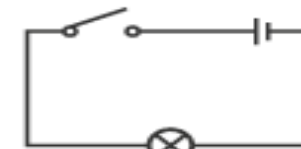
Electricity



Circuit
symbols



Different types
of circuits



Key Vocabulary

Eyes	Globular organs of sight in the head of humans and vertebrate animals
Filter	Pass through a device to remove unwanted material (liquid, gas, light or sound)
Light	The natural agent that stimulates sight and makes things visible
Light source	Something that provides light, whether it be a natural or artificial source of light (e.g. the sun, a torch)
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
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
Reflection	The throwing back by a body or surface of light, heat or sound without absorbing it
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
Shadow	A dark area or shape produced by a body coming between rays of light and a surface
Spectrum	A band of colours, as seen in rainbows, produced by separation of the components of light by their different degrees of refraction

Overview

- Light appears to travel in straight lines
- Because light travels in straight lines, objects are seen because they give out or reflect light into the eye.
- We see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- Because light travels in straight lines, shadows have the same shape as the objects that cast them.

Figure 1. How we see light sources

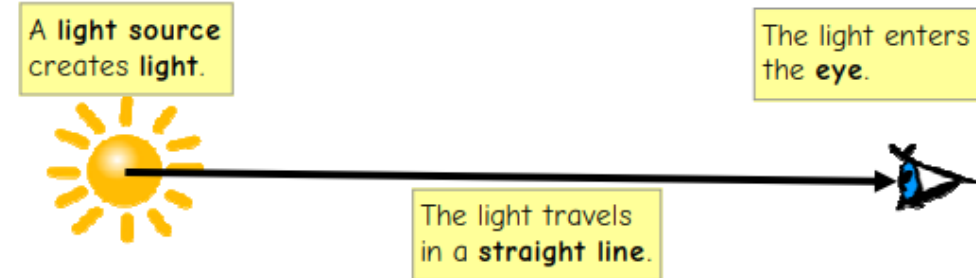
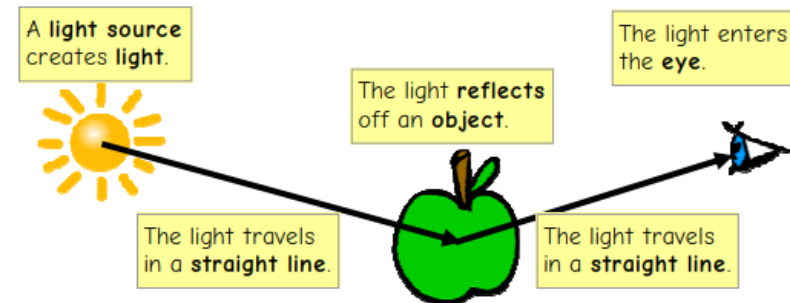


Figure 2. How we see objects that are not light sources

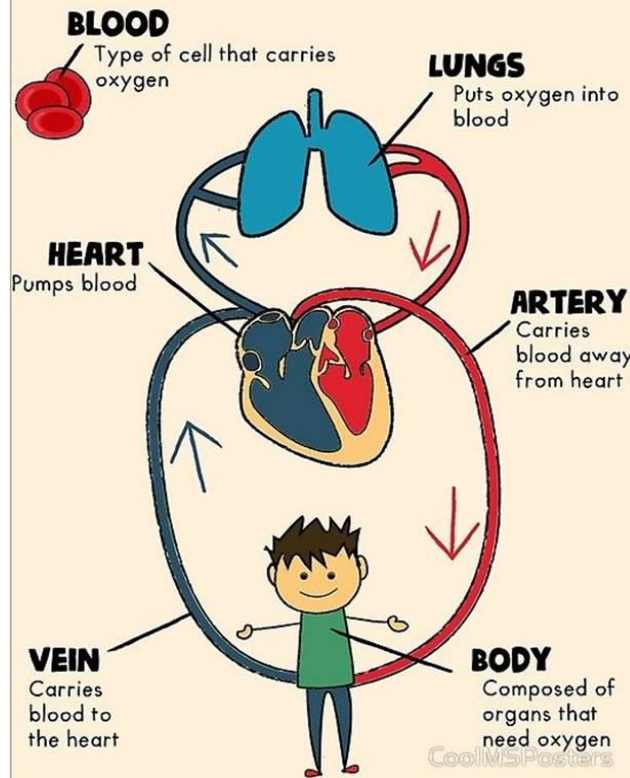


Vocabulary

aorta	the main artery through which blood leaves your heart before it flows through the rest of your body
arteries	a tube in your body that carries oxygenated blood from your heart to the rest of your body
atrium	one of the chambers in the heart
blood vessels	the narrow tubes through which your blood flows. Arteries, veins and capillaries are blood vessels.
capillaries	tiny blood vessels in your body
carbon dioxide	a gas produced by animals and people breathing out
circulatory system	the system responsible for circulating blood through the body, that supplies nutrients and oxygen to the body and removes waste products such as carbon dioxide.
deoxygenated	blood that does not contain oxygen
heart	the organ in your chest that pumps the blood around your body
lungs	two organs inside your chest which fill with air when you breathe in. They oxygenate the blood and remove carbon dioxide from it.
nutrients	substances that help plants and animals to grow
organ	a part of your body that has a particular purpose
oxygen	a colourless gas that plants and animals need to survive
oxygenated	blood that contains oxygen
pulse	the regular beating of blood through your body. How fast or slow your pulse is depends on the activity you are doing.
respiration	process of respiring; breathing ; inhaling and exhaling air
veins	a tube in your body that carries deoxygenated blood to your heart from the rest of your body
vena cava	a large vein through which deoxygenated blood reaches your heart from the body
ventricle	one of the chambers in the heart
via	through

CIRCULATORY SYSTEM

Delivers oxygen to the body



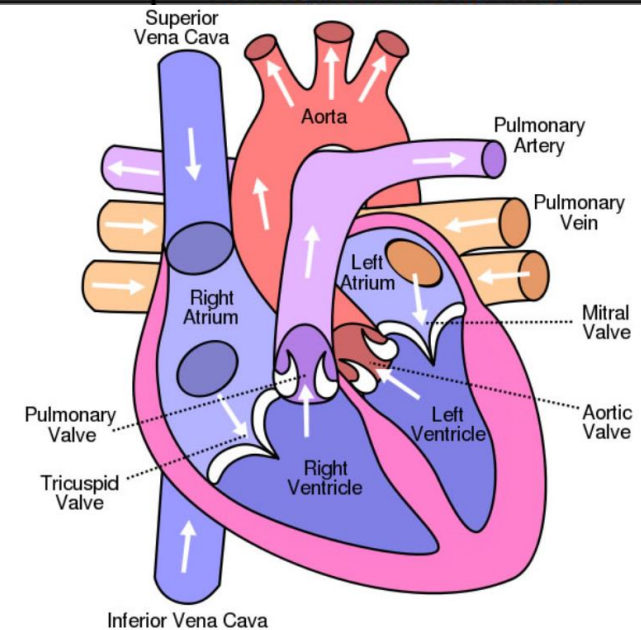
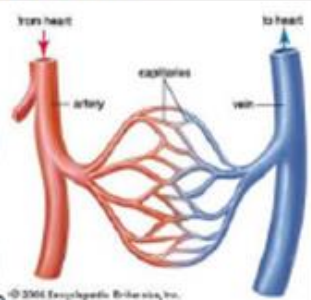
Choices that can harm the circulatory system:

- Some choices such as smoking, drinking alcohol and lack of exercise can be harmful to our health.
- Tobacco can cause short-term effects such as shortness of breath, difficulty sleeping and long-term effects such as lung and heart disease.

What will I know by the end of the unit?

What is the circulatory system?

- The circulatory system is made of the heart, lungs and the blood vessels.
- Arteries carry oxygenated blood from the heart to the rest of the body.
- Veins carry deoxygenated blood from the body to the heart.
- Nutrients, oxygen and carbon dioxide are exchanged via the capillaries.



Where this fits in our curriculum: This builds on the work in relation to the human body in KS1 and the skeletal, muscular and digestive and reproductive systems in KS2. It also links with work in PE and PSHE.

Key Vocabulary	
amphibian	Cold-blooded vertebrate that can live on both land and water. Lays eggs in water
bird	Warm-blooded vertebrate with feathers and wings, usually can fly. Lays eggs
Carl Linnaeus	Scientist famous for his work in the classification of living things. He was one of the first scientists to look at the relationship between living things and their environment
characteristics	The qualities or features that belong to something and make them recognisable
classification key	A system which divides things into groups or types
cold-blooded	Animals whose body temperature depends on the environment they live in
criteria	A factor on which something is judged
environment	Circumstances, people, things and events around that influence something's life
evergreen	Tree or bush that has green leaves all year round
flowering	Trees or plants that produce or bear flowers
habitat	Natural environment in which an animal or plant lives
herbivore	Animals that eats only plants
insects	Invertebrate creature with 3 pairs of legs and 3 body parts. Often have wings
invertebrates	Creature without a spine
mammals	Warm-blooded vertebrate that breathes air. Gives birth to live young
non-flowering	Trees or plants that don't produce flowers
omnivore	Creature that eats all food, plants and animals
reproduction	When animals or plants produce offspring similar to itself
reptiles	Cold-blooded vertebrate whose skin is covered in scales. Lays eggs
vertebrates	An animal with a spine

Overview

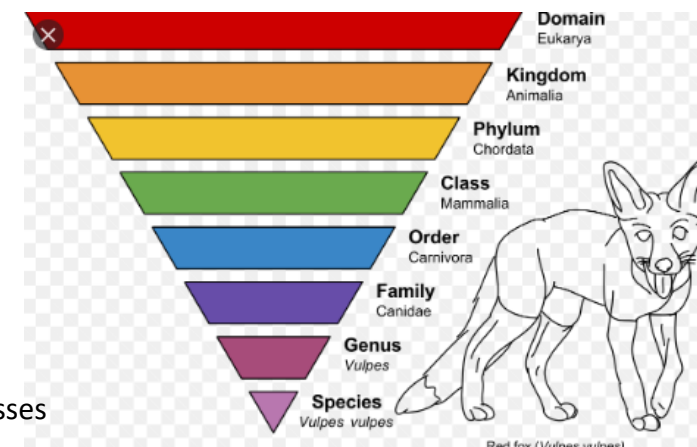
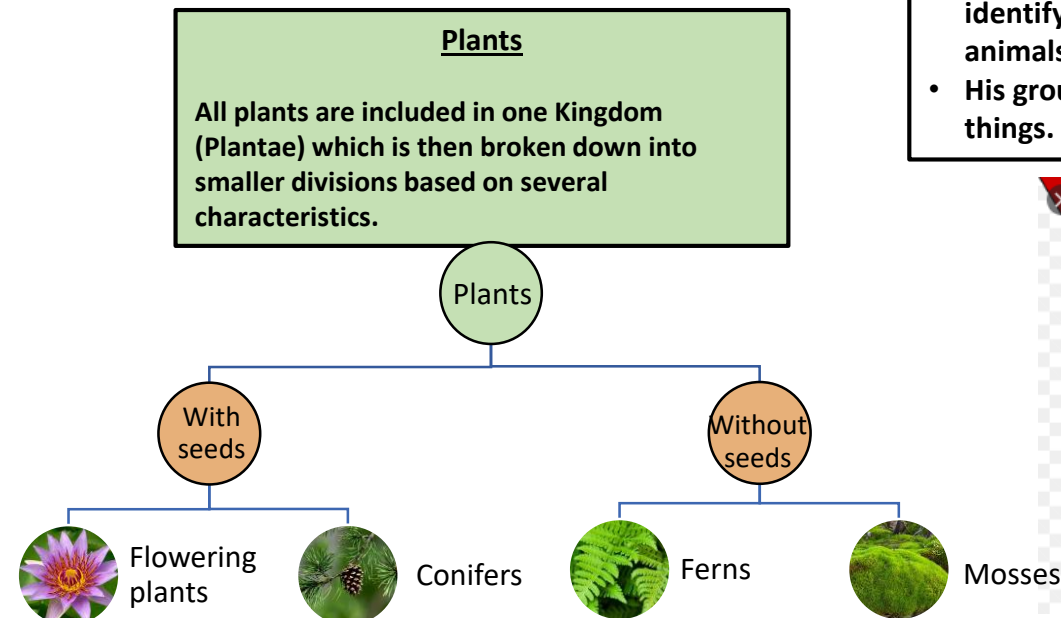
The Linnaean Classification System.

Scientists believe there could be as many as 10 million different species on Earth! Scientists group living things according to their similarities and differences.

Carl Linnaeus is the father of Taxonomy, which is the system of classifying and naming organisms. One of his contributions was the development of the Linnaeus system. This system includes eight groups – domain, kingdom, phylum, class, order, family, genus and species.



- Carl Linnaeus
- May 23rd 1707.
- A Swedish scientist.
- Famous for his work in taxonomy –the science of identifying, naming and classifying species (plants, animals etc)
- His groupings are still used today to classify living things.



Where this fits in our curriculum: This builds on the work on animals and living things and their habitats in KS1 and KS2.

Key Vocabulary

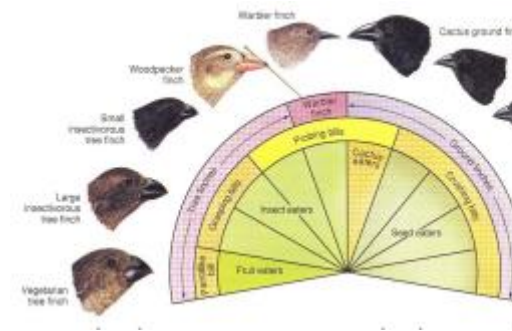
Adaption	An adaptation is a trait (characteristic) changing to increase a living thing's chances of surviving and reproducing in a given environment.
Ancestor	A person or animal from whom one is descended
Breeding	The process of producing plants or animals by reproduction.
Characteristic	A feature or quality belonging typically to a person, place, or thing, making them recognisable.
Environment	The circumstances, people, things or events which surround a person, animal, or plant.
Evolution	Adaptations that take place in a species over a long period of time in response to the environment.
Extinct	No longer has any living members, either in a particular place or in the world.
Fossil	The remains or imprint of a prehistoric plant or animal, embedded in rock and preserved.
Genes	A part of the DNA in a cell that controls the physical development, behaviour, etc. of an individual plant or animal and is passed on from it's parents
Inherit	If you inherit a characteristic, you were born with it because your parents or ancestors also had it.
Natural Selection	The process whereby organisms better adapted to their environment tend to survive and produce more offspring.
Offspring	A person's child by birth or animal's young.
Reproduction	When an animal or plant produces one or more individuals similar to itself.
Species	A class of plants or animals whose members have the same main characteristics and are able to breed with each other.
Theory	An formal idea that is intended to explain something.
Variation	A change or slight difference.

Where this fits in our curriculum:

This builds on the work on fossils in the Y3 science curriculum.

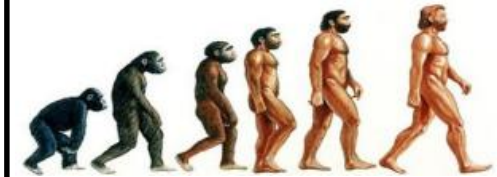
Charles Darwin's theory of evolution

The theory of evolution by natural selection is the process by which organisms change over a long period of time as a result of changes in response to the environment



Animals change over time and adapt to the surroundings in which they live. Darwin observed that there were many different forms of finch that had different beak sizes and shape. Once he considered the food source for each finch, he noted the reason for these adaptations.

Living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. In the same way that there is variation between parents and their offspring, there is variation within any species, even plants.



Variation in dog species



Variation in Hosta plant species

A fossil is the remains or impression of a prehistoric plant or animal embedded in a rock and preserved. Fossils can provide information about living things that inhabited the earth millions of years ago.



A blue arrow pointing to the right, containing the text "Assessment in science".

Assessment in science

EYFS	To ask scientific questions	To plan an enquiry	To make a prediction	To observe closely	To take measurements	To gather/record results	To present results	To interpret results	To draw conclusions	To evaluate an enquiry
Classification	Be able to ask questions about familiar objects or surroundings when sorting	Suggest / add items of similar type to given groups (add extra blue objects, shiny objects)	Ask children what they think might happen...in familiar situations	Be able to say something about / make a simple observation of e.g. colour, shape, size, texture.			Sort objects and living things into two simple groups (given criteria), e.g. all the blue things, all the heavy things.	Indicate which group includes more objects than the other	Be able to talk about why they think some things have happened	
Research	Ask questions about what they have observed.						Communicate what they have learnt through drawing.	Communicate orally, in simple descriptions and explanations, e.g. talk about their own environment.		
Comparative test	Suggest an idea for investigation. With support from teacher, frame as a	Select a piece of equipment they might use for a particular purpose, e.g.		Comment on what they see as they investigate.	Make comparisons through observation of e.g. size, weight,	Participate in class data collection.	Present information orally and in labelled drawings.	Answer questions in relation to, e.g. heavy /		

	simple question.	a slotted spoon to separate beads from sand.			distance travelled, capacity or position, measuring these using non-standard units, where appropriate.			light, fast / slow.		
Observation over time	Ask “why” questions based on their own interests.			Be able to comment on how things change over time e.g. how a plant has changed/ a tree over the seasons/ how they have changed from when they were a baby.		Take photographs of their findings	Produce labelled drawings to communicate their ideas			
Pattern seeking	Suggest an idea for investigation. With support from teacher, frame as a simple question.			Can comment on how 2 objects are different from one another. E.g. colour/ texture/		Participate in class data collection.	Talk about what they have found out.			

Assessment Milestones in Science

Working Scientifically						
	By the end of Year 2		By the end of Year 4		By the end of Year 6	
	Y1	Y2	Y3	Y4	Y5	Y6
Approaches to enquiry	<i>Children should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including (1) observing changes over a period of time, (2) noticing patterns, (3) grouping and classifying things, (4) carrying out simple comparative tests and (5) finding things out using secondary sources of information.</i>		<i>Children should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including (1) observing changes over time, (2) noticing patterns, (3) grouping and classifying things, (4) carrying out simple comparative and fair tests and (5) finding things out using secondary sources of information.</i>		<i>Children should select the most appropriate ways to answer science questions using different types of scientific enquiry, including (1) observing changes over different periods of time, (2) noticing patterns, (3) grouping and classifying things, (4) carrying out comparative and fair tests and (5) finding things out using a wide range of secondary sources of information.</i>	
Planning	<ul style="list-style-type: none">asking simple questions and recognising that they can be answered in different ways		<ul style="list-style-type: none">asking relevant questions and using different types of scientific enquiries to answer themsetting up simple practical enquiries, comparative and fair tests		<ul style="list-style-type: none">planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	
Observing	<ul style="list-style-type: none">observing closely, using simple equipmentperforming simple testsidentifying and classifying		<ul style="list-style-type: none">making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers		<ul style="list-style-type: none">taking measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings when appropriate	
Recording	<ul style="list-style-type: none">gathering and recording data to help in answering questions		<ul style="list-style-type: none">gathering, recording, classifying and presenting data in a variety of ways to help in answering questionsrecording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables		<ul style="list-style-type: none">recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphsreporting 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	
Concluding	<ul style="list-style-type: none">using their observations and ideas to suggest answers to questions		<ul style="list-style-type: none">reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusionsidentifying differences, similarities or changes related to simple scientific ideas and processes		<ul style="list-style-type: none">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	

		<ul style="list-style-type: none"> • using straightforward scientific evidence to answer questions or to support their findings 	
Evaluating		<ul style="list-style-type: none"> • using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions. 	<ul style="list-style-type: none"> • using test results to make predictions to set up further comparative and fair tests. • identifying scientific evidence that has been used to support or refute ideas or arguments



By the end of Year 2		By the end of Year 4		By the end of Year 6	
Y1	Y2	Y3	Y4	Y5	
<p>Can identify and name different familiar materials, including wood, plastic, glass, metal, water and rock</p> <p>Can sort objects according to the materials from which they are made</p> <p>Can describe the simple properties of a variety of materials, e.g. hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent</p> <p>Can identify at least two properties in a material using simple vocabulary correctly e.g. hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent</p> <p>Can recognise that an object like a spoon, a coat or a toy can be made from different materials and suggest why.</p>	<p>Can name a wide variety of materials (extending range from Y1), e.g. wood, metal (iron, steel, copper, aluminium), plastic, leather, glass, brick, rock (contrasting examples like chalk and granite), cotton, wool, paper and cardboard</p> <p>Can describe how materials have been used to make different objects, including objects made of more than one material</p> <p>Can describe how their actions, e.g. push, pull, twist, squash, cause the shape of solid objects to change</p> <p>Can explain how varying their actions (applying a larger force) affects how an object changes shape, e.g. 'if I pull my sock hard it stretches and gets longer'</p> <p>Can identify that not all plastics are the same and link the specific properties of different types of plastic to their use for different purposes, e.g. cling film wrapping, carrier bags, water bottles, scissors, tables and chairs</p> <p>Can identify why certain materials are used for specific purposes. Focus on properties that make a material useful, e.g.</p> <ul style="list-style-type: none"> Can identify and compare materials that might be used for certain purposes, deciding which would be 	<p>Can compare and group different kinds of rocks (used in familiar buildings / contexts) on the basis of their appearance and simple properties, e.g. whether they have visible crystals or not, whether they have fossils in them or not, whether they are permeable or impermeable, their durability and evidence of erosion.</p> <p>Can describe (in simple terms) how fossils are formed when things that have lived are trapped within certain rocks.</p> <p>Can explain (in simple terms) that soils are made up from rocks that have been broken down into tiny particles by weather and erosion and that this is combined with organic matter, such as dead vegetation and animal bones.</p> <p>Can describe similarities and differences between soils of different type (some from the locality).</p>	<p>Can compare and group a variety of materials according to whether they are solids, liquids and gases.</p> <p>Can describe properties of typical solids, liquids and gases</p> <p>Can identify a range of materials as solid based on their properties; including those that flow like a liquid e.g. sand, flour and those that are not rigid, e.g. sponge, fabrics, flexible plastics.</p> <p>Can explain how we know a gas is present, even though it cannot be seen, e.g. gas in fizzy drinks, gas inside a balloon, gas contained in soils and rocks.</p> <p>Can describe what happens as water is heated to boiling point.</p> <p>Can use terms associated with the water cycle, e.g. water vapour, evaporation, condensation</p> <p>Can give examples of changes of state where changes are reversible, within the water cycle</p> <p>Can explain that water evaporates at a faster rate if temperatures are higher, washing drying on line / e.g. puddles on playground over radiator.</p>	<p>Understand and can use science vocabulary to describe properties, e.g. relative hardness, permeability, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <p>Can carry out comparative tests of specific properties of materials and order results, e.g. relative transparency of different materials – variety of transparent, translucent and opaque materials...</p> <p>Know that some materials dissolve, while others do not dissolve and give examples.</p> <p>Recognise degrees of solubility and how this might change, e.g. as temperature increases. Identify when a solution is saturated and explain why this happens (in terms of particles) <i>Consider including dissolving in Y4 too (but ensure that learning does not directly repeat in Y5</i></p> <p>Can describe how to retrieve dissolved solids from a solution (reversible change). Understand ways that the rate of evaporation to retrieve a dissolved solid can be slowed or increased.</p> <p>Can describe ways of separating materials from a liquid that have not dissolved, e.g. by filtering or sieving as appropriate.</p> <p>Can separate a mixture containing a dissolved solid and two undissolved solids.</p> <p>Knows that some changes are irreversible, e.g. burning and rusting.</p> <p>Can select appropriate materials and structures to use as packaging for products, e.g. chocolates, for different purposes (more complex requirements), e.g. to protect chocolates from heat/water damage, breakage, changes in temperature (thermal insulation)</p> <p>Dissolved gases as well as solids – how many burps in a bottle of lemonade?</p> <p>Can describe examples of reversible and irreversible changes, identifying permanent changes that have taken place, e.g. light and burn a candle, bake cakes, look for rusting metals around school or reversible e.g. freezing flavoured water to make lollies, making ice cream, melting and cooling chocolate to make crispy cakes</p>	

	best, e.g. which material would make the best...coat for a rainy day?			
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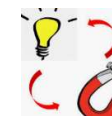


By the end of Year 2		By the end of Year 4		By the end of Year 6	
Y1	Y2	Y3	Y4	Y5	Y6
<p>Can identify and name a number of common wild and garden plants found in the school grounds – 5 or more of each, including some familiar trees. <i>Choose local named examples – about 20, e.g. dandelion, daisy, nettle, pansy, rose, sunflower, trees – willow, cherry</i></p> <p>Can name the basic parts of flowering plants, e.g. flower, stem, trunk, leaf and root – <i>picked up again in Y3</i></p> <p>Understands that plants can be very different, e.g. that trees, grass, garden plants and indoor plants are all different types of plant</p> <p>Can use the word deciduous to describe plants that lose their leaves in autumn and evergreen to describe plants that keep their leaves (and indicate some familiar examples) – <i>relevant to seasonal change</i></p>	<p>Can describe how seeds and bulbs change as they germinate and grow into mature plants</p> <p>Can recognise that different seeds and bulbs grow into different types of plant</p> <p>Can use key vocabulary to describe observations of changes that take place, e.g. shoot, seedling, grow, growing, (germination), names of parts of plant</p> <p>Can explain in simple terms what happens if a plant has too little / too much water or light – use plants (already growing) such as pansies, runner beans, sweet peas and carry out simple comparative tests.</p> <p>Can describe what plants need to keep them healthy.</p> <p>Knows (and can describe) how to care for plants that they grow in a pot, container or planted garden</p> <p>Notifies that plants (in a raised bed or garden) grow better when they are watered regularly and kept weed free</p> <p>Knows that plants that grow in different places in the school grounds are suited to the conditions there, e.g. meadow flowers in uncut areas, daisies and dandelions on school field,</p>	<p>Can name the basic parts of flowering plants, e.g. flower, stem, trunk, leaf and root (<i>building on Y1</i>), recognising examples in contrasting plants, e.g. on the class tree, buddleia bush, daisy/dandelion plant.</p> <p>Can identify and describe the jobs done by different parts of flowering plants, e.g. flower, stem, trunk, leaf, root and fruit (including nuts and seeds).</p> <p>Recognise that different plants require different conditions and react in different ways when they don't have enough light, water, nutrients or room to grow.</p> <p>Can explain, using accurate vocabulary, what happens when plants don't have enough light, water, nutrients or room to grow.</p> <p>Can describe how water is transported through a plant, entering through the roots and leaving through the leaves.</p> <p>Notice that flowers play an important part in the life cycle of flowering plants, including pollination, seed formation and seed dispersal – <i>links to reproduction and life cycles in Y5. Ensure that examples are different from those planned for Y5.</i></p> <p><u>Animals including humans</u></p> <p>Can explain that animals, including humans, have different requirements</p>	<p>Use appropriate vocabulary as they identify and name familiar animals and plants.</p> <p>Can suggest different ways of grouping living things, e.g. as flowering / non-flowering plants; vertebrate animals as fish, amphibians, reptiles, birds and mammals and invertebrate animals as snails and slugs, worms, spiders and insects.</p> <p>Can suggest ways that environments can change and that this can sometimes pose dangers to living things. Give positive and negative examples of human (their) impact, <i>e.g. planting a bumblebee friendly garden (appropriate planting – links to planting programme), dropping lots of litter on a local beach / in a park.</i></p> <p>Can use classification keys to help group, identify and name a variety of living things in their local and wider environment. <i>Links to Y6</i></p>	<p>Can compare the life cycles of plants and animals in their local environment with other plants and animals around the world</p> <p>In plants: Can describe the life cycle of a variety of plants, naming the stages i.e. germination, growth, flowering, fertilisation, pollination, seed dispersal.</p> <p>Can explain why each stage of the life cycle of a plant is important to the reproduction of plants.</p> <p>Can use scientific vocabulary to name and describe reproductive parts of a flower, their function and the process of reproduction, e.g. flower, petals, carpel, stamen, ovary, pollen, seed, fruit.</p> <p>Explain that different plants are pollinated in different ways, i.e. insects, wind, water, mechanical, and give real examples.</p> <p>In animals: Can describe the life cycle of a variety of animals, <i>e.g. several familiar and less familiar mammals – cow/sheep, dog/cat, hedgehog/squirrel, polar bear/killer whale, an amphibian other than a frog – newt, several familiar and less familiar insects – bumble bee, butterfly, woodlouse, spider, ladybird, several familiar and less familiar birds – blackbird, robin, duck, chickens, owl, peregrine falcon.</i></p>	<p>Can describe how/why living things are classified into broad groups, i.e. according to their observable characteristics – <i>e.g. there are several different varieties of prunus (cherry) trees around the school grounds. Their leaves are similar, but there are differences in flower structure (multi petals or single petal) and shape of tree.</i></p> <p>Can use the correct vocabulary to describe types of animals, e.g. amphibians, reptiles, birds, mammals, vertebrates, invertebrates, arachnid, mollusc, insect, crustacean – <i>building on Y5</i></p> <p>Can give reasons for classifying plants based on specific characteristics.</p> <p>Can give reasons for classifying animals based on specific characteristics</p>

<p><u>Animals including humans</u> Can identify and name a number of common animals, including fish, amphibians, reptiles, birds and mammals - <i>5 or more of each (where possible), including familiar pets</i></p> <p>Can identify and name familiar animals that are carnivores, herbivores and omnivores, e.g. eagle, fox, cat, dog and lion as carnivores; sheep, cow, goldfish, giraffe as herbivores; human, hedgehog, pig, badger as omnivores.</p> <p>Can name the body parts of some familiar animals, e.g. of a goldfish, frog, lizard, blackbird and dog and suggest how they are the same and different</p> <p>Can compare the body parts of humans to those of other animals and suggest how they are similar and different</p> <p>Can use correct vocabulary to name the main body parts (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth teeth) and identify where they are on the body</p>	<p>rushes and water lilies around pond.</p> <p><u>Animals including humans</u> Can name the simple stages of different animal life cycles, as they describe how animals grow and change, e.g. caterpillar, pupae, butterfly or frog spawn, tadpole, frog or baby, toddler, child, teenager, adult – <i>ensure these life cycles are not re-taught explicitly in Y5</i></p> <p>Can show understanding that the offspring of a familiar animal will grow and change over time to become more like its parent – <i>links to Y6 Evolution and inheritance</i></p> <p>Can describe what animals, including humans, need to live and be healthy, e.g. understand that they need water, food and air</p> <p>Can name a variety of animals that have different diets, describing them (where appropriate) as carnivores, herbivores and omnivores and talking about what they eat – <i>builds on Y1, introduction of carnivores, herbivores and omnivores. Links to Y3 Animals including Humans.</i></p> <p>Can describe what humans need to keep them fit and healthy and give relevant examples from their own lives. <i>Links to Y3 Animals including Humans.</i></p>	<p>for nutrition (food) – referring back to Y1 animals that are carnivores, omnivores or herbivores</p> <p>Can identify different types of food and organise into basic food groups, e.g. dairy and eggs, meats, grains, fruit and vegetables – builds on Y1 and links to Y6 Animals including Humans</p> <p>Can recognise the need for a balanced diet for good health, e.g. that a little chocolate is good, but too much can lead to health problems, but fruit and vegetables can safely be eaten in greater quantity links to Y6 Animals including Humans</p> <p>Can explain that animals including humans have skeletons of different types – discussion might include exoskeleton of familiar insects</p> <p>Can identify and describe function of parts of skeleton, e.g. backbone and muscles – support, skull and ribcage – protection, long bones – movement</p>	<p><u>Animals including humans</u> Identify and name the main body parts associated with the digestive system, and use the correct vocabulary, i.e. mouth, tongue, teeth, oesophagus, stomach and small and large intestine</p> <p>describe the simple functions of the basic parts of the digestive system in humans</p> <p>identify the different types of teeth in humans and their simple functions</p> <p>comparing the teeth of carnivores and herbivores, and suggesting reasons for differences</p> <p>Know what damages teeth.</p> <p>construct and interpret a variety of food chains, identifying producers, predators and prey</p>	<p>Can compare the life cycles of different animals, recognising similarities and differences, <i>e.g. typical mammal compare with an insect (ladybird) and or amphibian (newt).</i></p> <p>Recognise and use term metamorphosis for lifecycles of insects and amphibians.</p> <p>Know about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.</p> <p>In plants: Can describe the difference between sexual and asexual reproduction and give examples, e.g.</p> <p>Know that some plants have male and female flowers, e.g. holly, courgette, marrow, horse chestnut tree, holly tree, while others have flowers with male and female plants, e.g. pansy, sunflower, daffodil, rose, poppy, daisy.</p> <p>Can describe how plants reproduce asexually, e.g. by throwing out runners (e.g. strawberry, blackberry), and that gardeners can generate new plants by taking leaf, stem or root cuttings from a parent plant.</p> <p>In animals: Can describe sexual reproduction (as part of the life cycle) in a variety of animals.</p> <p>Include; mating rituals – birds, mammals; male and female roles in reproduction – raising young</p>	<p><u>Animals including humans</u> Can describe how the heart works using the correct vocabulary.</p> <p>Can describe how the circulatory system works using the correct vocabulary.</p> <p>Can describe what happens to the heart when a person exercise</p> <p>Can compare graphs of different heart rates and discuss how they are different or the same.</p> <p>Can describe what is needed for a balanced diet, identifying the types of foods needed. Building on Y3</p> <p>Can give examples of how a diet needs to be adjusted in certain circumstances e.g. an athlete, for a vegetarian, a marathon runner, a diabetic or a coeliac.</p> <p>Can describe what happened to a person when they don't have the appropriate lifestyle including the use of drugs.</p> <p><u>Evolution & Inheritance</u> Know about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution</p>
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	<p><u>Living things and their habitats</u> Can compare a variety of objects and describe the differences between things that are living, dead, and things that have never been alive</p> <p>Can identify living things that live in familiar local habitats and say how they are suited to that habitat</p> <p>Can describe how different habitats provide for the basic needs of different kinds of animals and plants, i.e. food, water and shelter</p> <p>Can identify and name a variety of plants and animals in familiar, local habitats – <i>expect greater variety in naming, building on those plants and animals named in Y1</i></p> <p>Can identify and name different sources of food, e.g. for familiar animals such as hedgehog, fox, snail, wild birds</p> <p>Can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain</p> <p>Construct a simple food chain that includes humans (e.g. grass, cow, human).</p> <p>Compare animals in familiar habitats with animals found in less familiar habitats, for</p>			<p>(as part of the reproductive cycle); length of gestation...</p> <p>Know that some animals (can) reproduce asexually, e.g. stick insects, earthworms.</p>	<p>Can explain, in more detail, the formation of fossils of various types (including dinosaurs) – building on introduction in Y3 - rocks</p> <p>Can describe what fossils tell scientists about living things that lived millions of years ago, but are now extinct or have evolved.</p> <p>Know that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles</p> <p>Know that variation in offspring over time can make animals more or less able to survive in particular environments</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
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	example, on the seashore, in woodland, in the ocean, in the rainforest.				
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By the end of Year 2		By the end of Year 4		By the end of Year 6	
Y1	Y2	Y3	Y4	Y5	Y6
<p><u>Seasonal Change</u></p> <p>Can name the four seasons of the year</p> <p>Can describe, in simple terms, differences between the seasons, e.g. by noticing differences in a series of images</p> <p>Can notice and describe changes they observe taking place in the natural environment around school, e.g. to a familiar deciduous tree</p> <p>Can name different types of weather, e.g. sunny, windy, rainy, cold, hot, foggy, icy</p> <p>Can describe how they feel in specific weather conditions</p> <p>Can make observations of weather over time and record these using a simple chart</p> <p>Can make observations and talk about changing light and day length.</p>		<p><u>Light</u></p> <p>Can explain that some light is needed if we are to see anything, i.e. that a 'dark' room usually has some light in it, so we can see objects dimly.</p> <p>Can explain that light reflects from surfaces and this enables us to see – include here objects that reflect light differently e.g. shiny/reflective surfaces and different colours Links to Y6</p> <p>Can describe how a shadow is formed, i.e. by an opaque object blocking the light Links to Y6</p> <p>Can describe what happens to shadows when a light source moves or the distance between the light source and the object changes.</p> <p>Links to Y6 Know that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p><u>Forces</u> Can use correct vocabulary when describing how magnets work, e.g. 'North' and 'South' poles, attract / repel, attraction / repulsion.</p> <p>Can make predictions and / or describe what will happen when like and different poles of two magnets are placed next to one another.</p> <p>Can explain that not all metal objects are magnetic, i.e. that objects made of iron and steel are magnetic (age</p>	<p><u>Sound</u></p> <p>Can use appropriate vocabulary related to sound, e.g. vibrate, pitch, volume, comparatives – loud/soft, gentle/strong, louder/softer, higher/lower, as they describe and explain their ideas.</p> <p>Can describe how a sound is made when an object vibrates, e.g. when a guitar string is plucked..., or when a drum skin is hit.... It vibrates, making a sound.</p> <p>Can explain that we hear sounds because sound travels through a medium, i.e. a solid, a liquid or a gas, to our ears.</p> <p>Can describe in simple terms how our ears enable us to hear.</p> <p>Recognises that sound can be insulated by certain materials, e.g. if we close the door it reduces the noise from the corridor.</p> <p>Describe how the pitch of an instrument can be changed and identify a pattern, e.g. the longer the string the lower the note, the tighter the string the lower the note.</p> <p>Describe how the volume of sounds can change and recognise that e.g. strong</p>	<p><u>Earth in space</u></p> <p>Can describe how the view we have of the Moon changes over the course of a (lunar) month. Uses correct vocabulary to name Moon phases.</p> <p>Can name the planets and identify their order in the solar system. Uses a mnemonic of their own design to remind them of their order.</p> <p>Knows that planets orbit the Sun and that they take different amounts of time to do so.</p> <p>Can describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Understands, through modelling, the relative sizes of different bodies in the solar system, e.g. compares Sun and Earth, Mercury and Saturn etc.</p> <p>Describe how the position of the Earth, relative to the Sun, affects the seasons on Earth.</p> <p>Explain that the Earth rotates and that this causes day and night and the apparent movement of the Sun across the sky</p> <p>Recognises that the existence of time zones around the Earth makes a difference to the time of day it is in other countries, e.g. compare UK to other known countries, like Sierra Leone. Links to light in Y6</p> <p><u>Forces</u></p>	<p><u>Light</u></p> <p>Explain that we see things because light travels from the object or is reflected from the object travels into our eyes.</p> <p>Can understand that light appears to travel in straight lines.</p> <p>Explain what happens when light is shone on an object.</p> <p>Explain how an object is seen i.e. Light travels from light sources to our eyes or from light sources to objects and then to our eyes.</p> <p>Describing how light behaves to explain why shadows have the same shape as the objects that cast them. E.g. I know that light travels in a straight line and when it is blocked, it casts a shadow in the shape of the object that has blocked it.</p> <p>Describing the size of shadows when the position of the light sources changes. E.g. Explaining why it is that the lower the light source is positioned, the longer the shadow of the object is. Builds on Y3</p>

		<p>appropriate – there are others) while most other metals, including copper, brass and aluminium, are not.</p> <p>Can compare how objects move over different surfaces, e.g. rolling a car, sliding a box loaded with weights, and describe what makes a difference.- links to Y5</p> <p>Notifies that some forces need contact between two objects, e.g. kicking a ball, opening a door, pushing a swing, but magnetic force can act at a distance.- links to Y5</p>	<p>vibrations produce louder sounds.</p> <p>Electricity Identify common appliances that run on electricity by listing a number of common objects that need electricity to function.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers – <i>Link to Y6</i></p> <p>Associate metals with being good conductors whilst recognising some common conductors and insulators. Show understanding through explaining the differences – <i>Link to Y6</i></p> <p>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 – <i>Link to Y6</i></p> <p>Observe patterns e.g. bulbs get brighter if more cells are added or that some materials can/can't be used to connect across a gap in a circuit. They may explain what happens when extra components are added to a circuit with the same battery – <i>Link to Y6</i></p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit – <i>Link to Y6</i></p>	<p>Can explain the force of gravity in simple terms, as the 'pull' that acts on objects which fall towards the Earth.</p> <p>Can identify and describe the effects of other forces that act between moving surfaces, i.e. friction, air resistance and water resistance.</p> <p>Can describe how simple mechanisms 'make work easier' and give examples, e.g. gears on a bike, a lever to open a tin, nut crackers...</p>	<p>Electricity Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. May use some scientific vocabulary: electrical current, amp, volts – builds on Y4</p> <p>Draw simple, circuit and parallel diagrams using recognised symbols including lights, wires, switches and cells – builds on Y4</p> <p>Understand and explain different types of electricity: static electricity electric shocks, force fields</p> <p>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 using some scientific vocabulary that could include: current, voltage, amps, bulb ratings</p> <p>Construct simple series and parallel circuits to help them answer questions about what happens – builds on Y4</p>
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