

Animals including Humans

KS1

Science Strand

Biology

What I should already know

- Say some animals names.
- Name some human body parts.
- Name some animal body parts.
- Know there are 5 main animal groups.
- Know animals eat different things; some animals eat plants, some animals eat meat and some eat both.
- Humans have 5 senses.

What I will know by the end of this unit

- **Animals** and **humans** have **offspring** which will grow into an **adult**.
- Young animals have a different name to their parents.
- Animals and humans need **food**, **water**, **shelter** and **warmth** to **survive**.
- Animals and humans need to do **exercise** often to keep themselves **healthy**.
- Animals and humans need to eat the right type and the right amount of food to stay healthy. This is called a **diet**.
- It is important that humans clean themselves. Having good **hygiene** will keep them safe and healthy.
- It is important animals are looked after so that they stay healthy too.

What I will be able to do by the end of this unit

- **Ask questions** about animals and humans.
- **Compare** offspring to their parents.
- **Make careful observations**.
- **Take accurate measurements**.
- **Record** what I have found out using simple tables and graphs. findings in different ways.
- **Explain** what animals need to survive.

Vocabulary

animal

human

offspring

young

adult

food

shelter

warmth

energy

survive

nutrition

survive

diet

reproduce

exercise

healthy

hygiene



Everyday Materials

KS1

Science Strand

Chemistry

What I should already know or do

- Materials are used to make things that I use.
- Materials are all around me.
- Materials can feel and look different.
- Explain how materials feel or what they look like.

What I will know by the end of this unit

- **Materials** are what everyday **objects** are made from.
- Name materials; **plastic, wood, metal, rock, brick, paper, cardboard and glass.**
- Materials are chosen for **particular** jobs such as glass has been chosen for windows. If windows were not made of glass, light could not shine through them and we could not see out of them.
- Some **solid materials** can be made into different **shapes.**
- Materials can be changed by **squashing, bending, twisting** and **stretching** them.
- Some materials can be **recycled.**
- **Recycling** is when we take a material and it is made into something else.

What I will be able to do at the end of this unit

- **Ask questions** about materials.
- **Compare** objects made from similar or different materials.
- **Sort** objects by the material they are made from using Venn Diagrams and Classification Keys.
- **Make careful observations** of an object and the material it is made from.
- **Explain** the suitability of materials and why they have been chosen for a particular job or not.
- **Investigate** the changes in objects when they are squashed, bent, twisted and stretched by performing a simple test.
- Make a **prediction.**
- **Record results** using a simple table and bar graph.
- **Conclude** what I have found out.
- **Explain** what recycling is.
- **Explain** why it is important to recycle

Vocabulary

material

properties

suitability

matter

force

friction

natural

man-made

object

substance

liquid

solid

Can You Stretch It?



Can you Twist It?



Can You Bend It?



Can You Squash It?



Living Things & Their Habitats

KS1

Science Strand

Biology

What I should already know

- Living things need food, water and air to stay alive.
- A habitat is a place where a living thing lives.

What I will know by the end of this unit

- All **living** things are alive.
- Some things are **dead** and some have **never been alive**.
- All living things can **move, breathe, grow, eat, reproduce, excrete** and **sense the world around them**.
- A **habitat** is a **natural environment** or home for lots of different plants and animals.
- Animals **depend** on these things to stay alive; food, water, warmth, air and shelter.
- A **food chain** shows how animals are related to each other by what they eat.
- Something that is the food is the **producer**.
- Something that eats the food is the **consumer**.
- A **carnivore** eats meat, a **herbivore** eats plants and an **omnivore** eats both plants and meat.

What I will be able to do by the end of this unit

- **Ask questions** about animals and their habitats.
- **Sort** animals into groups according to what they eat using Venn Diagrams or classification keys.
- **Explain** how animals obtain their food from plants and other animals, using a simple food chain.
- **Record** what I have found out using labelled pictures.

Vocabulary

living

dead

never alive

food chain

carnivore

herbivore

omnivore

producer

consumer

habitat

natural

environment

depend

adapt

producer



consumer

Plants

KS1

What I should already know

- Plants are living things, that means they are alive.
- Plants can grow and reproduce.
- Name some plants and trees.
- Name some parts of a flowering plant and a tree.
- Describe what happens to plants and trees through the seasons.

What I will know by the end of this unit

- **Plants** grow from **seeds** and **bulbs**.
- Plants need air, water, time, warmth, **nutrients** from soil and light to grow.
- Seeds come from the **flowering plant**. Seeds are baby plants that have not grown yet.
- Bulbs are **mature plants** that have grown up before, and made by the mature plant under the ground.
- Seeds and bulbs have a **store** of food inside them to help the plant to grow until it can make its own food.
- **Germination** is the name for when a plant starts to grow. Seeds and bulbs **germinate** and grow into **seedlings** which then grow into **mature plants**.
- Plants have a **life cycle** that helps them to keep **reproducing**.

What I will be able to do by the end of this unit

- **Ask questions** about plants.
- **Name** and **label** the different parts of a plant.
- **Explain** the importance of each part of a plant.
- **Compare** different seeds and bulbs, looking for similarities and differences.
- **Sort** seeds and bulbs using a Venn Diagram.
- **Investigate** what plants need to grow and to be healthy by setting up a fair test.
- **Make predictions**
- **Make careful observations**.
- **Take accurate measurements** and record data using simple charts, tables and drawings.
- **Record** what I have found out using scientific language.
- **Conclude** what I have found out.

Science Strand

Biology

Vocabulary

living things

plants

trees

flowers

seeds

bulbs

nutrients

flowering plant

mature plant

food store

germination

germinate

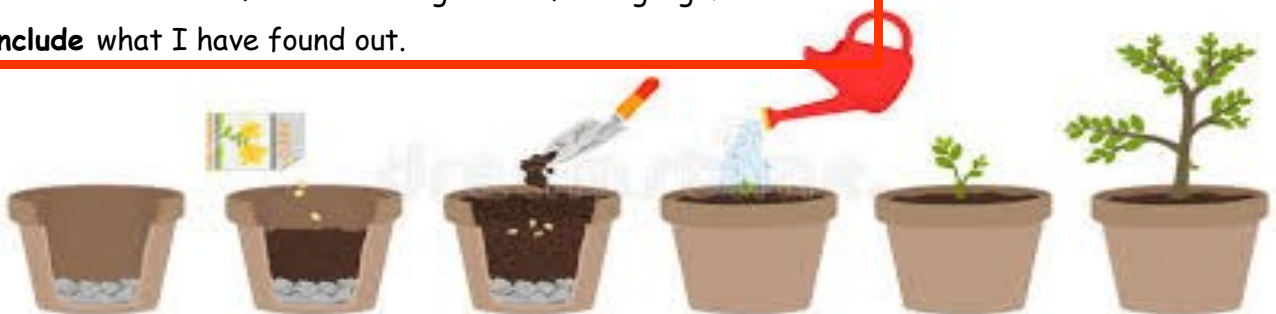
seedling

life cycle

reproduce

grow

temperature



Seasonal Changes

KS1



What I should already know

- There is day and night.
- The sun shines in the day. The moon shines at night.
- There are days, weeks and months of the year.
- There are different types of weather.

What I should already know

- There are 4 seasons. They are **Spring**, **Summer**, **Autumn** and **Winter**.
- **Nature** changes during the seasons.
- Each season has a different **weather**.
- Weather is made from the sky. The weather can be **windy**, **rainy**, **sunny**, **foggy**, **frosty**, **cloudy**, **stormy** or **snowy**.
- Each season has a different **temperature**..
- We wear for different clothes during each seasons and for different **weathers**.
- We celebrate different occasions in each season.
- **Day length** is different across the seasons.
- We can measure **weather** using a **rain gauge**, a **wind vane**, a **windsock** and a **thermometer**.

What will I know by the end of this unit

- **Ask** questions about the changes between the seasons.
- **Observe** changes in nature.
- **Describe** changes and patterns and relationships between the seasons.
- **Use equipment** such as a rain gauge, wind vane and thermometers
- **Use observations** to suggest answers to questions
- **Collect** data.
- **Record** data using simple tables and pictographs.
- **Talk about** what they have found out
- **Use scientific language**.

Science Strand

. Physics

Vocabulary

seasons

spring

summer

autumn

winter

nature

weather

temperature

day length

rain gauge

wind vane

windsock

thermometer

weather
forecast



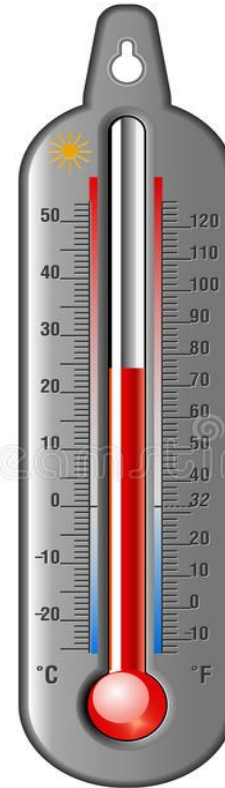
Seasonal Changes Vocabulary and Knowledge Mat

KS1

Seasonal Activities



A thermometer



Can you explain the differences between the four seasons?



Seasonal Celebrations



Important Words that I need to know

seasons	spring	summer	autumn	winter
nature	weather	temperature	day length	thermometer
pain gauge	Wind vane	windsock		weather forecast



Seasonal Changes Vocabulary and Knowledge Mat



KS1

4 seasons

Autumn

Winter

Spring

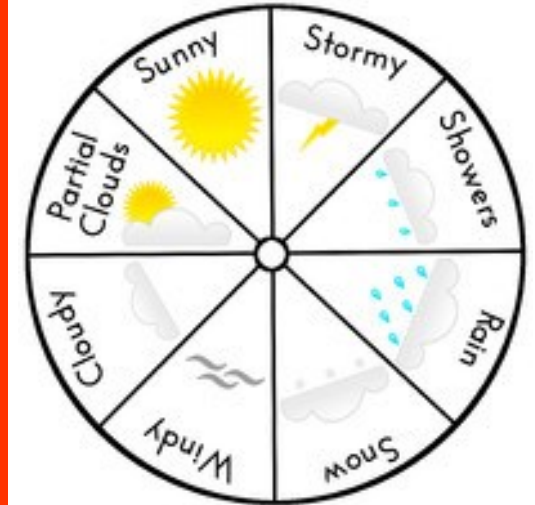
Summer

A tree in all seasons

Daylight hours each month:

Month	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Hours of Daylight	13	11	9	8	8	10	12	14	15	16	16	14

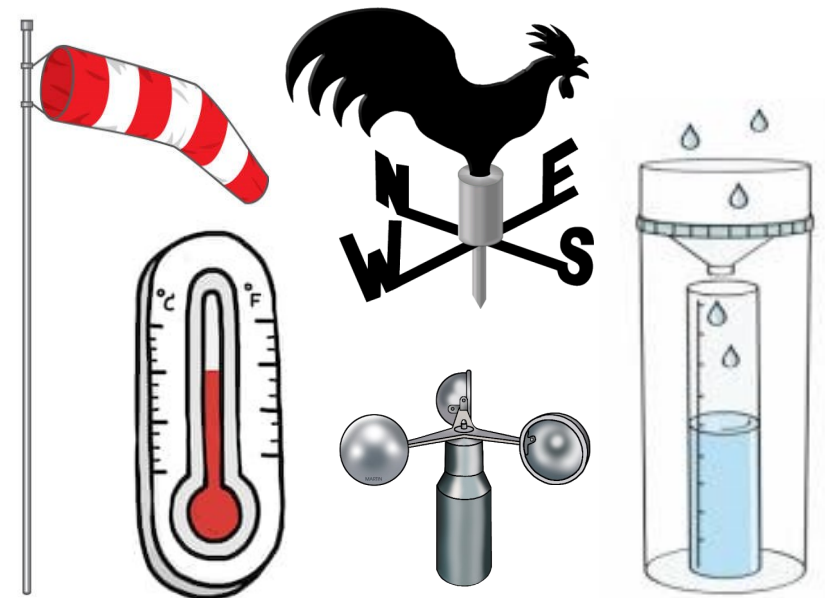
A weather wheel



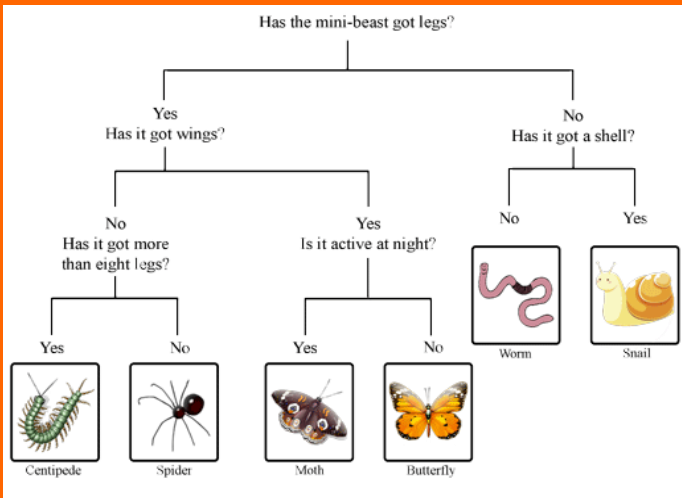
A tree in all seasons



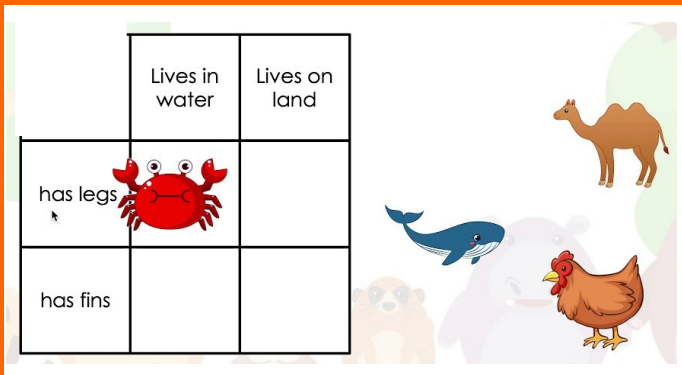
What we use to measure the weather



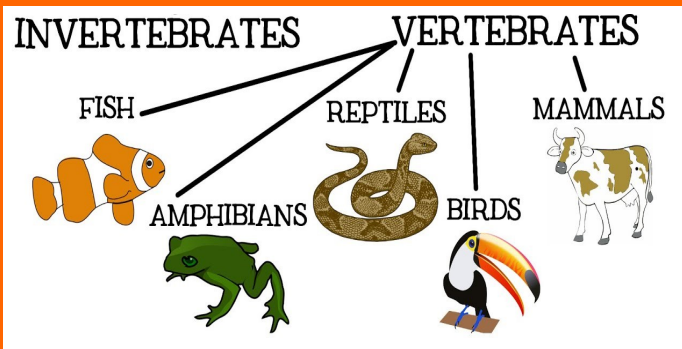
Example of a classification key



Carroll Diagram



Animal Classification

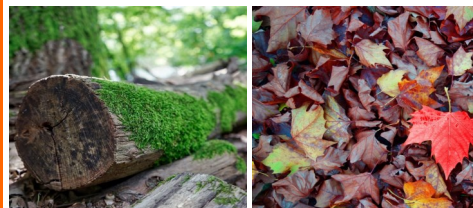


Subject Specific Vocabulary

vertebrate	These are animals with a backbone	amphibians	A cold-blooded animal that have gills. They can live in water and on land.
invertebrate	These are animals without a backbone	mammals	A mammal is a warm blooded animal that breathes air, has a backbone, and grows hair or fur.
classification key	A tool that I can use to help me to help sort animals and plants.	survive	To stay alive
Carroll diagram	A tool that I use to group living things together based on whether it fits the criteria.	warm or cold blooded	Warm blooded animals have a body temperature that usually stays the same. Cold blooded animals become hotter and colder depending on the temperature outside.
microhabitat	A very small habitat which supports the survival of micro animals or plants.	Nature reserves	A place where animals and plants are protected
habitat	This is a place or a home where a plant or animal lives.	pollution	Is when something is added to the environment that is harmful or poisonous to living things.
fish	An animal that lives in water and has fins for swimming and gills for breathing.	deforestation	This is the clearing or the cutting down of forests.
reptiles	A cold-blooded animal that breathes air and usually has the skin covered with scales or bony plates.		

Microhabitats

Microhabitats are small places where little animals like to live such as worms, woodlouse and spiders. A micro-habitat might include a pond, a rotten tree stump, a space between a paving stones or a mouldy apple.



Positive and Negative Effects on our Planet Earth

There are many different things we can do to help the planet.

Plastic is one of the most problematic materials which have a **negative** effect on the environment. Cutting down trees and littering also has a **negative effect** on animals and plants. Do you know why? Protecting endangered species and cleaning lakes and seas has a **positive effect** on the environment.

By **recycling** we can have a **positive** effect on the environment. As well as recycling at home, we might recycle at school. We all have to work together to become more **sustainable** by using plastic less and recycling more, by planting more trees and by looking after nature.

What will I know by the end of this unit?

- **Fish** are cold blooded animals. They live in water and breathe using gills. They have scales and fins, and lay soft eggs.
- **Reptiles** are **cold blooded** animals with scales. They have dry skin. They lay eggs.
- **Birds** are **warm blooded** animals with feathers and wings. They lay eggs.
- **Amphibians** are cold blooded with moist skin. They live on land and in water, and they lay lots of soft eggs.
- **Mammals** are warmed blooded with fur. They breathe air and give birth to live young.
- **Vertebrates** are animals with a backbone.
- **Invertebrates** are animals without a backbone.
- **A habitat** is a place or home from living things.
- **Classification** is arranging into groups based on similarities.
- **Classification Key** is a set of questions that help to identify living things.
- **Carroll diagram** is used to group things according to whether it fits certain criteria.
- **Deforestation** is the cutting down of forests. When the trees are chopped down many animals lose their **habitats**.
- **Nature reserves** are places where **wildlife** are protected.

Deforestation

Deforestation is when trees are cut down to make things, to grow crops or to provide places where farm animals can graze.

Some of the crops grown are coffee, rubber trees or palm trees. People make lots of money from selling the coffee beans, sap and **palm oil**.



Science

Year 4

Topic: Living things and their habitats — classification

Strand: Biology

What should I already know?

- There are many living things in the world.
- Living things live in habitats which they are best suited.
- The six main groups are: invertebrates, mammals, birds, amphibians, reptiles and fish.
- Animals are grouped by their similarities and differences.

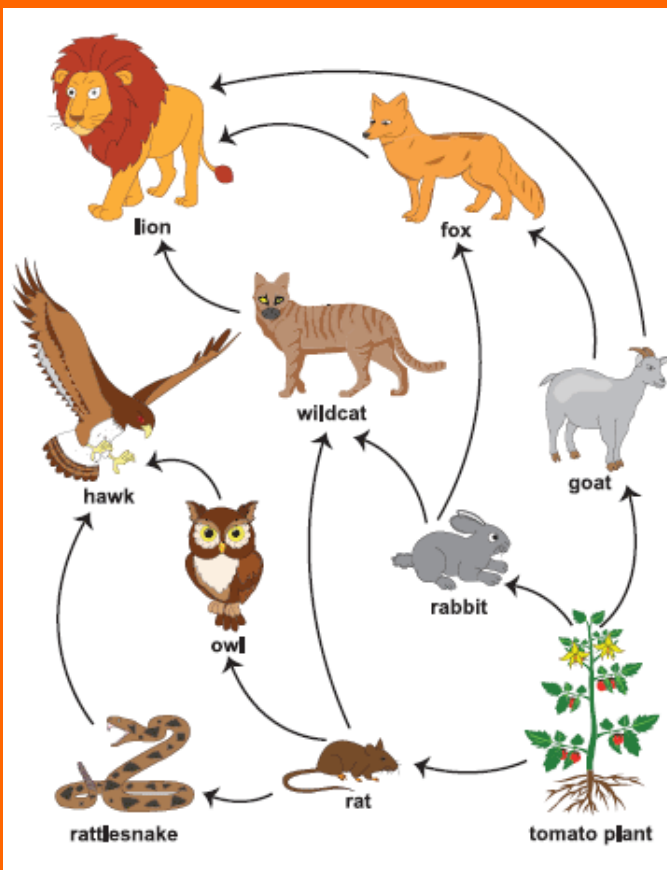
Scientific Skills

- Ask questions about animals.
- Sort and classify difference and similarities between living using a classification key.
- Sort and group living things according to whether they fit the criteria using a Carroll Diagram.
- Plan a simple comparative or fair test.
- Make careful observations.
- Take accurate measurements.
- Record what I have found out using written explanations, diagrams and labels as well as tables and graphs.
- Use scientific language.
- Research about the human effects on the planet.
- Create posters to teach and inspire others to care for the planet.

Teeth of a herbivore and a carnivore



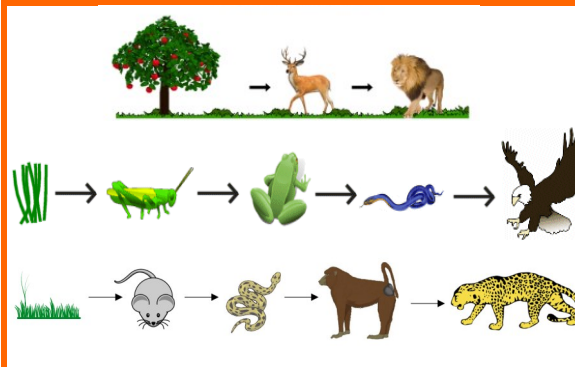
Food web



Subject Specific Vocabulary

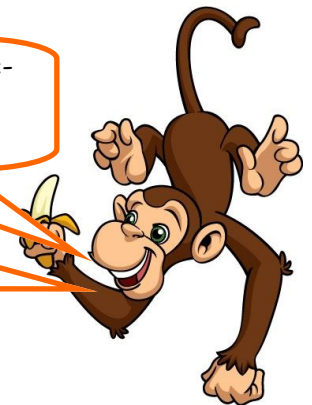
consumer	This is name given to anything that eats something.	omnivore	This is an animal that eats both plants and meat.
predator	This is an animal that hunts, catches and eats other animals.	apex predator	This is a predator who is at the top of the food chain,
prey	This is the animal that the predator hunts.	organism	Living thing are made up of one or more cells and are able to do all 7 life processes; move, breathe, grow, eat, excrete, sense and reproduce.
producer	A producer make its own food. It is always at the beginning of a simple food chain.	digestive system	This is the body's process or power of changing food into simpler forms that energy from food can be taken and used.
food chain	This shows how each living thing depends on one another for their food.	stomach	The stomach is a hollow organ. Its main job is to store and
food web	This is similar to a food chain however each organism can eat more than one thing and be eaten by more than one thing.	intestine	The intestine is shaped like a long tube. This is where digestion takes place. Nutrients get absorbed into the body. The body can then use it for energy.
carnivore	This is an animal that eats meat.	Teeth	Teeth are hard, bony structures that grow from the jawbone. Humans and other animals use their teeth to bite, to grind and to chew food.
herbivore	This is an animal that eats plants.		

Food chains



Can you explain the differences between a herbivore and carnivore's teeth and their diet?

Can you explain the difference between a herbivores and a carnivores digestion system?



What should I already know?

- All living things need water, food and air to survive.
- Carnivores eat meat.
- Omnivores eat plants and meat.
- Herbivores eat plants.
- A food chain shows the order in which living things depend on each other for food.

Scientific Skills

- Ask questions about animals and what they eat.
- Sort animals into groups.
- Create a food chain and a food web.
- Set up my own simple investigation.
- Make careful observations.
- Take accurate measurements
- Record what I have found out using written explanations, diagrams, labelled pictures, tables or graphs.
- Use simple scientific language.
- To research about different types of animals

Types of consumers



Science

Year 4

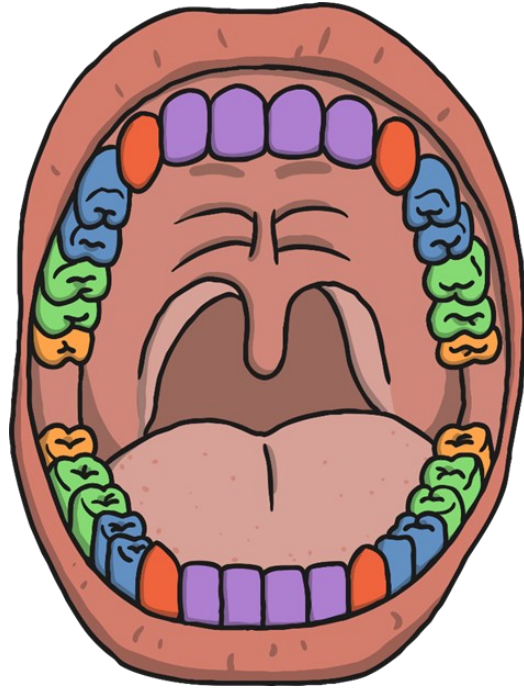
Topic: Animals inc. Humans - Food Chains

Strand: : Biology

What will I know by the end of this unit?

- All animals are **consumers**. They have to eat to survive.
- A **producer** makes their own food.
- **Producers** are the beginning of a simple **food chain**.
- A **predator** is an animal that hunts, catches and eats other animals.
- An **Apex Predator** is a predator at the top of the **food chain**.
- Animals the predator hunts are called **prey**.
- **Herbivores** have large, flat teeth so that they can grind plants.
- **Carnivores** have mostly sharp teeth so they can cut through meat.
- Carnivores have a simple **digestive system**, whereas herbivores are much more complicated because plants are harder to digest.
- A **food chain** shows the order of how each living thing gets food, and how nutrients and energy are passed from one to another.
- A **food web** is similar to a food chain but each living thing can eat more than one thing and be eaten by more than one thing.
- An **ecosystem** is made up of all of the living and non-living things in an area.
- An **organism** is a living thing.

Location of teeth in the mouth



Children will get 20 teeth. These are known as 'baby teeth'.

An adult can have 32 teeth, excluding their wisdom teeth.

- Canine
- Molars
- Premolars
- Incisors
- Wisdom Teeth

Subject Specific Vocabulary

molar	A grinding tooth at the back of a our mouth	fluoride	A liquid that helps stop decay of the teeth. It is found in tooth paste.
premolar	Another grinding tooth near to back of our mouth. They are in front of the molars	digestive system	This is a system in our body that help us to digest our food and helps us to keep the body healthy.
incisor	A narrow edged tooth at the front of the mouth. It is used for cutting or biting food.	stomach	It helps us to digest the food.
canine	A pointy tooth located near the front of the month. It is used for ripping food.	oesophagus	This is the throat or tube that leads to the stomach.
enamel	This is a protective coat on top of the tooth.	large intestine	In the large intestines food is digested.
plaque	This is a sticky deposit on teeth in which bacteria multiply. Plaque is often a darker colour.	small intestine	In the small intestines food is absorb.
decay	This is when teeth begin to rot.	liver	Is the largest solid organ in the body. It produced a liquid called bile and it cleans the blood.
acid attack	Eating too much sugary foods can cause damage to our teeth.	rectum/anus	The rectum is at the end of the small intestine. It is where faeces are stored before leaving the body through the anus
cavities	These are holes in our teeth.		
enzymes	These cause a reaction in the		

Fluoride

3 Fast Facts About Fluoride



Used in goods like toothpaste and mouthwash.

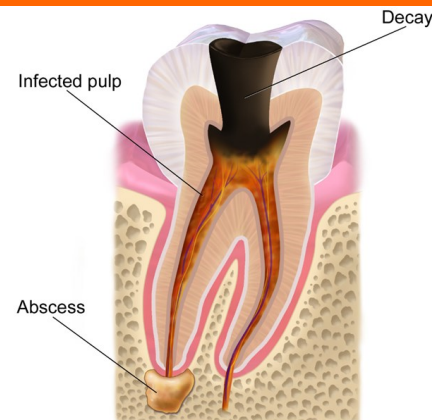


Added to local drinking water to prevent cavities.



A mineral found in rocks, soil, water and air.

An infected tooth



Tooth decay



Tooth decay is the breakdown of tooth enamel. It can lead to holes called cavities.

Tooth decay is caused by bacteria in the mouth. The bacteria make a sticky substance called plaque. It eats away at the enamel.

Why is fluoride important?



Different types of teeth

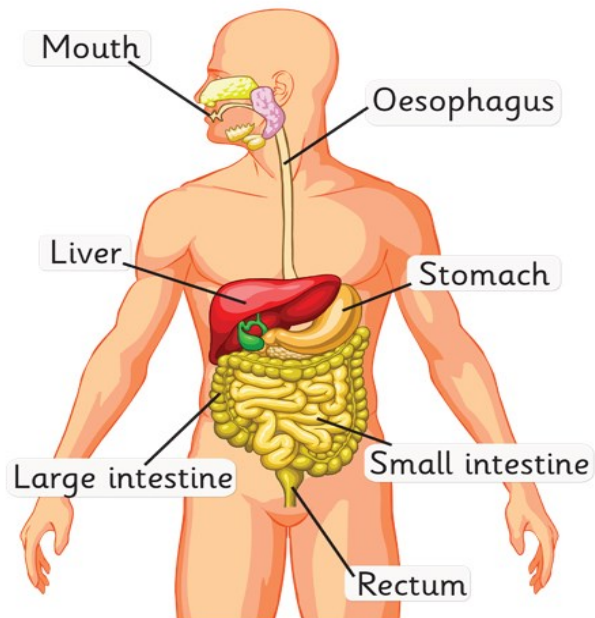


incisor molar premolar canine

What will I know by the end of this unit?

- **Molars** grind food.
- **Incisors** cut up food.
- **Canines** tear up food.
- **Premolars** grind up food.
- **Fluoride** helps protect our teeth. Fluoride is in toothpaste
- Too much sugary drinks and food can **decay** our teeth. This is called an **acid attack**.
- Decay can result in holes known as **cavities** appearing in the white **enamel**, and these holes can get bigger and cause toothache..
- Decay is known as **plaque**. It is a yellow substance that covers our teeth.
- Brushing teeth should last for two minutes, and it should be done in the morning and at night.
- The **digestive system** helps to turn food and liquids into **energy** for the body.
- The digestive system starts at the **mouth**, it travels through the **oesophagus**, into the **stomach** and through the **intestines**. At the end of the **digestive system** is the **rectum** and the **anus**.
- Another word for poo is **faeces** or **stools**.

Our Digestive System



Science

Year 4

Topic: Animals including humans _Teeth and the Digestive System

Strand: Biology

What should I already know?

- I know the basic parts of the human body.
- I have 5 senses; sight, hearing, touching, tasting and smelling
- The eyes help me to see.
- The nose helps me to smell.
- The ears help me to hear.
- The mouth and tongue helps me to taste things.
- The skins helps me to feel or touch things.
- I have a skeleton and I have muscles.
- Some animals have a skeleton and muscles too, however, their skeleton looks different to mine.
- The skeleton and the muscles help me to move.

Scientific Skills

- To ask questions about teeth.
- To set up simple comparative and fair tests.
- To compare the teeth of carnivores and herbivores.
- To explore and investigate what damages teeth.
- To make observations and take accurate measurements.
- To record what I found out using written explanations, labelled diagrams and tables.
- To explain what I can do to look after my teeth.

What will I know by the end of this unit?

- Electricity is a type of **energy**.
- Electricity is used to **power** lots of things, including many items that we use in everyday life such as a toaster, game console and lights.
- Electricity can be stored in **batteries** and can be sometimes called **cells**.
- Electricity can flow in simple **series circuits**.
- The flow of electricity is known as a **current**.
- In a series circuit I will need **wires**, a **bulb** and a **battery** to make a light come on.
- The position of each **component** in a series circuit is important to make the lamp work.
- A **switch** can open and close a circuit.
- Some materials **conduct** electricity. They let electricity to travel through it.
- Some materials are **insulators**. They don't let electricity to travel through them.
- The brightness of the bulb can change by adding or removing other components.
- **Voltage** is the electrical **force** that forces electricity to flow. A **volt** is a measure of electrical pressure.
- A **watt** is the power or energy used by a circuit.

Electrical Appliances



Science

Year 4

Topic: Electricity

Strand: Physics

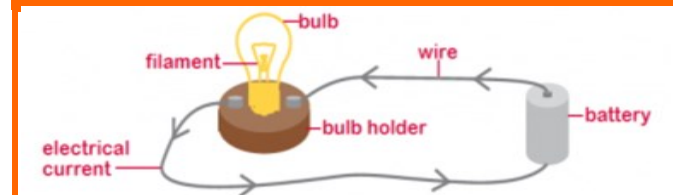
What should I already know?

- Electricity makes things work.
- We plug things in to make them work.
- Electricity travels through wires.
- We switch things on and off.
- Electricity is in their homes and in their school.
- Electricity can be dangerous.

Scientific Skills

- Ask questions about electricity.
- Sort and classify objects using a criterion.
- Set up comparative and fair tests.
- Explore and investigate how to make a series circuit and how to put a switch into the circuit to create a break in the flow of energy.
- Explore and investigate which materials are good conductors of electricity and which material are good insulators.
- Make careful observations.
- Explain what I found out using scientific language.
- Use written explanations, drawings and labelled diagrams to help me to explain what I found out.

A Series Circuit



Electrical Conductors and Insulators

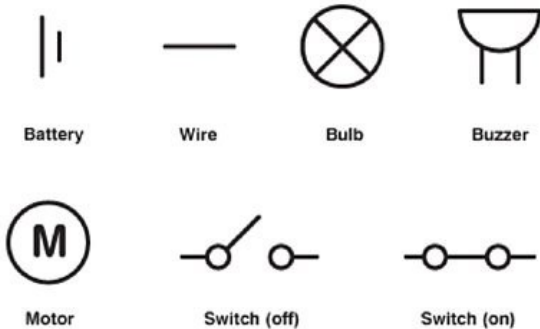
5 Electrical Conductors



5 Electrical Insulators



Circuit Symbols



Subject Specific Vocabulary

electricity	Electricity is a form of power. It is a flow of tiny particles called electrons and protons.	current	This word is used to describe the flow of electricity around the circuit.
energy	Energy is the ability to do work. Energy is how things change and move.	wire	This is made of metal. It allows electricity to travel across it to other components in the circuit.
power	This is the rate in which energy is used.	bulb	This is a component that produces light from electricity.
battery batteries	A battery is a sort of container that stores energy (electricity) until it is needed.	component	This is an object that is placed in a circuit. A circuit needs different components to work.
cells	A cell has two ends, labelled + (positive) and - (negative).	conductor	This is a material that allows electricity to travel through it.
series circuit	A series circuit consists of a single pathway through which electricity can flow.	insulator	This is a material that does not allow electricity to travel through it.
appliances	Appliances are electrical machines that help us to complete tasks.	renewable energy	This is made from resources that nature will replace like wind, water and sunshine
voltage	Is the electrical force that forces electricity to flow. A volt is a measure of electrical pressure.	non-renewable energy	This is energy that the Earth has created but will run out like, coal, oil and nuclear power

Danger! Danger!

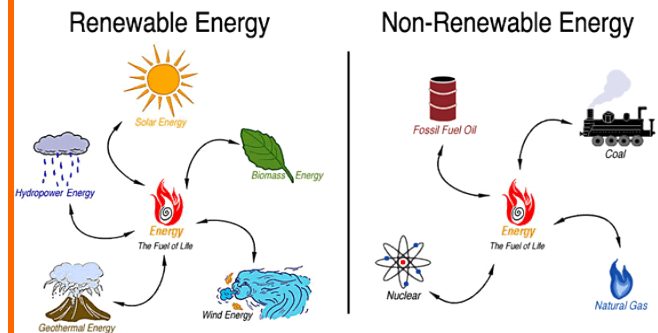
Electricity can be extremely dangerous if it is not used safely.

Important Electrical Safety Trips

- Do not put fingers and other objects in a plug socket.
- Never use anything with a cord or plug around water.
- Don't put metal spoons or bowls in a microwave.
- Stay away from power stations and power lines.
- Never pull a plug out by its cord.
- Never touch or climb trees near power lines.



Different types of energy

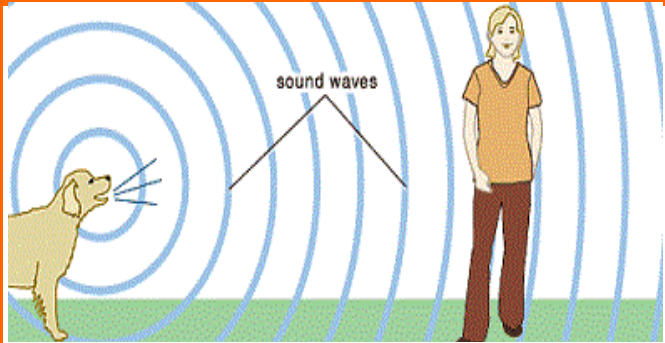


What materials make good conductors of electricity?

Why is it important to use renewable energy?

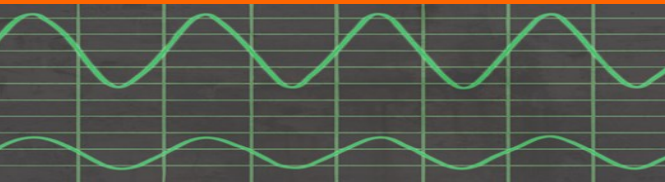


Sound Waves



Sound waves are created when something vibrates.

Sound waves; loud and quiet

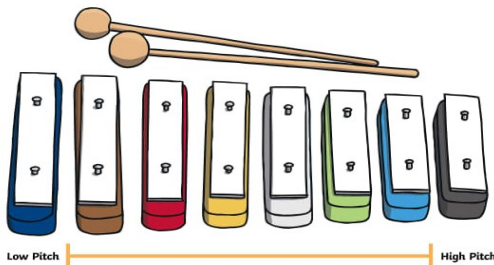


The stronger the vibration the louder the sound. The louder the sound, the greater amplitude will be. If you think about playing a guitar, a guitar string plucked strongly makes a loud sound whilst a guitar plucked gently makes a soft sound.

Pitch

High and low are words to describe the pitch of a sound. Pitch is the measure of how high or low a sound is. High sounds can be quiet or loud and low sounds can be quiet or loud too! Different materials produce different pitches; if an object vibrates quickly we hear a high-pitched sound, and if an object vibrates slowly we hear a low-pitched sound.

Also, the shorter, tighter or thinner the object is, the higher the pitch. This is because the vibrations will be faster. The longer, looser and thicker the object is, the lower the pitch of sound will be. This is because the vibrations will be slower.



Subject Specific Vocabulary

sound	Sound is a type of energy made by vibrations.	amplitude	This measures the sound waves.
outer ear	This part of the ear is visible. It is on the side of the head.	decibel	This is the unit of measure that we use to measure sound.
inner ear	This part of the ear isn't visible. It is inside the head.	particles	These are tiny bits of matter that make up everything in the universe.
middle ear	This is an air-filled space that turns sound waves into vibrations and delivers them to the inner ear. The middle ear is separated from the outer ear by the eardrum.	vibrations	Something that moves quickly, up and down and may even be seen to shake.
ear canal	This is a path from the outer ear to the inner ear.	sound wave	Sound waves are vibrating energy that look like waves
eardrum	This is a part of the middle ear. It is the part of the ear which vibrates.	pitch	How high or low a sound is.
cochlea	This is a part of the middle ear. It looks like a snail. It helps to send the messages to the brain.	volume	This describes how loud or quite a sound is.
		distance	Is how far one thing is from another thing. It is also a measure of the space between two things.

How waves travel

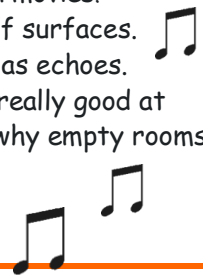
If you throw a stone in a pond, it will produce ripple. As the ripples spread out across the pond, they become smaller.

When sound vibrations spread out over a distance, the sound becomes quieter just like the ripple in a pond.



How sound travels

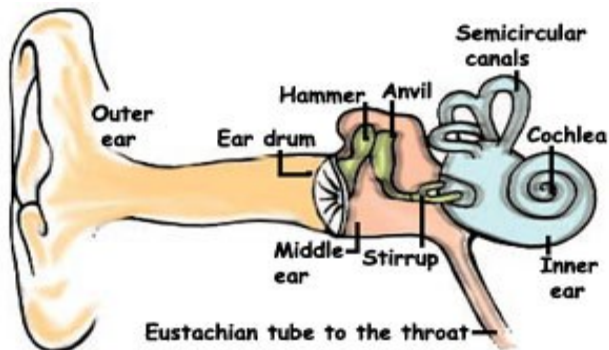
Sound waves can travel through solids like metal, liquids like water and gases like air. But they can't travel through empty space which has nothing, not even air, in it. That's why in space, there is no sound at all, whatever you might have seen in movies! Sound waves can reflect off surfaces. We hear sound reflections as echoes. Hard smooth surfaces are really good at reflecting sounds - this is why empty rooms produce lots of echoes.



What will I know by the end of this unit?

- Our **ear** hears **sound**. Hearing is one of our **5 senses**.
- Sound travels into the ear via the **outer ear** and the **ear canal**. Sound is then **vibrated** onto the **ear drum**. Messages are sent from our **inner ear** to the brain.
- **Sounds** are made with something vibrating.
- **Vibrations** from sounds travel from a object through the air to the ear.
- Vibrations pass from **air particle** to air particle and so on until it reaches the ear.
- Hear **patterns** between the **pitch** of a sound and the part of the object that produced it.
- Hear patterns between the **volume** of a sound and the strength of the vibrations that produced it.
- Sounds get fainter as the distance from the **sound source** increases.
- The faster the vibrations the higher the sound and slower vibrations the lower the sound.
- The loudness of sound is measured in **decibels**.
- The size of the vibration is called the **amplitude**.

The inner ear



Hearing is one of the 5 senses. Ears detect vibrations in the air. There are 3 parts to the ear:

Outer ear: We can see this part. It is called the pinna. It also included the ear canal and ear drum.

Middle ear: There are 3 small bones—hammer, anvil and stirrup. The smallest bones in the body!

Inner ear: Sound reaches a small tube like a snail shell called the cochlea. It is filled with fluid which moves tiny hairs that send signals to the brain.



Science

Year 4

Topic: Sound

Strand: Physics

What should I already know?

- Hearing is one of the 5 senses.
- We hear with our ears.
- Sounds can be loud and quiet.

Scientific Skills

- Ask questions about sounds
- Set up simple comparative and fair tests.
- Make careful observations.
- Take accurate measurements using standard units.
- To record what I found out using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- To explain how sound travels.
- To explain the different patterns of sound.

Deafening noise!

Very loud sounds can cause pain and damage our ears. Therefore, people who do noisy jobs wear ear defenders to protect their ears.



I hear thunder... I hear thunder...

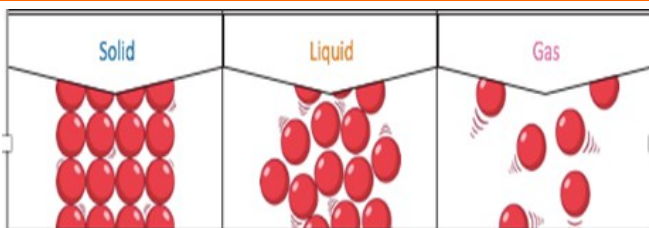


During a thunder storm you see lightning flash before you hear the thunder. This is because light travels faster than sound.

What will I know by the end of this unit?

- There are three states of matter: **solid**, **liquid** and **gas**.
- When **water** and other **liquids** reach a certain temperature, they change **state** into a **solid** or a **gas**.
- The temperatures that these changes happen at are called the **boiling**, **melting** or **freezing** point.
- If a **solid** is heated to its **melting point**, it melts and changes to a **liquid**. This is because the particles start to move faster and faster until they are able to move over and around each other
- When **freezing** occurs, the particles in the liquid begin to slow down as they get colder. They can then only move gently on the spot, giving them a solid structure
- **Evaporation** occurs when water turns into water **vapour**. This happens very quickly when the water is hot, like in a kettle, but it can also happen slowly like a puddle evaporating in the warm air.
- **Condensation** is when **water vapour** is cooled down and turns into water. You can see this when droplets of water form on a window. The **water vapour** in the air cools when it touches a cold surface.

Particles in solids, liquids and gases



Particles in a solid are close together and cannot move. They can only vibrate.

Particles in a liquid are close together but can move around each other easily.

Particles in a gas are spread out and can move around very quickly in all directions.

States of Matter

Science

Year 4

Topic: States of Matter

Strand: Chemistry

What should I already know?

- Everyday objects are made from materials.
- Different materials have certain properties.

Scientific Skills

- Ask questions about solids, liquids and gases.
- Compare and group materials together, according to whether they are solids, liquids or gases.
- Describe difference between solids, liquids and gases.
- Plan and set up a comparative or fair test.
- Make careful observations of materials
- Take accurate measurements using a thermometer.
- Research the temperature at which water cools and heats in degrees Celsius.
- Investigate the effect of temperature with evaporation.
- Make links to evaporation and condensation with how it fits into the water cycle

Solid, Liquid and Gas



The water cycle

The world's water moves between lakes, rivers, oceans, the atmosphere and the land in an ongoing cycle called - you guessed it! - the **water cycle**. As it goes through this continuous system, it can be a liquid (water), a gas (vapour) or a solid (ice).



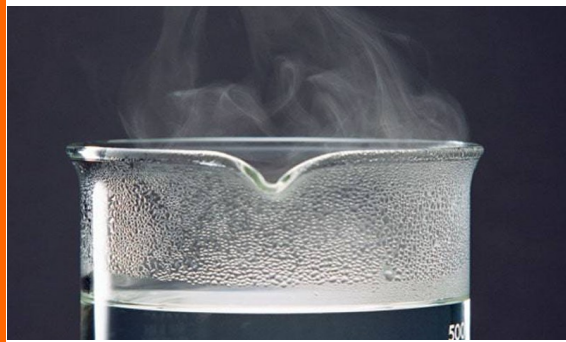
Water vapour

When it is cold outside, sometimes you can see your own breath. The water vapour from your mouth condenses to form tiny water droplets and ice particles.



Evaporation

Water from lakes, puddles, rivers and seas is **evaporated** by the sun's heat, turning it into **water vapour (evaporation)**.



Condensation

This **water vapour** rises, then cools down to form water **droplets** in clouds (**condensation**).



Subject Specific Vocabulary

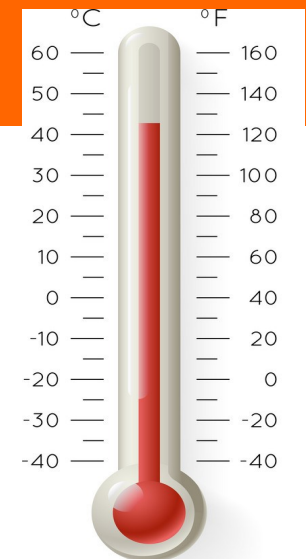
states of matter	Materials can be one of three states: solids, liquids or gases. Some materials can change from one state to another and back again.	evaporate	Turn a liquid into a gas.
		condense	Turn a gas into a liquid.
solids	These are materials that keep their shape unless a force is applied to them. They can be hard, soft or even squashy. Solids take up the same amount of space no matter what has happened to them.	precipitate	Liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.
		melt	This is when a solid changes to a liquid.
liquids	Liquids take the shape of their container. They can change shape but do not change the amount of space they take up. They can flow or be poured.	freeze	Liquid turns to a solid during the freezing process.
		particles	Are tiny bits of matter that make up everything in the universe.
gases	Gases can spread out to completely fill the container or room they are in. They do not have any fixed shape but they do have a mass.	cycle	A circle of events that repeat
		vibrate	A rapid motion back and forth
water vapour	This is water that takes the form of a gas. When water is boiled, it evaporates into a water vapour.		

Thermometer

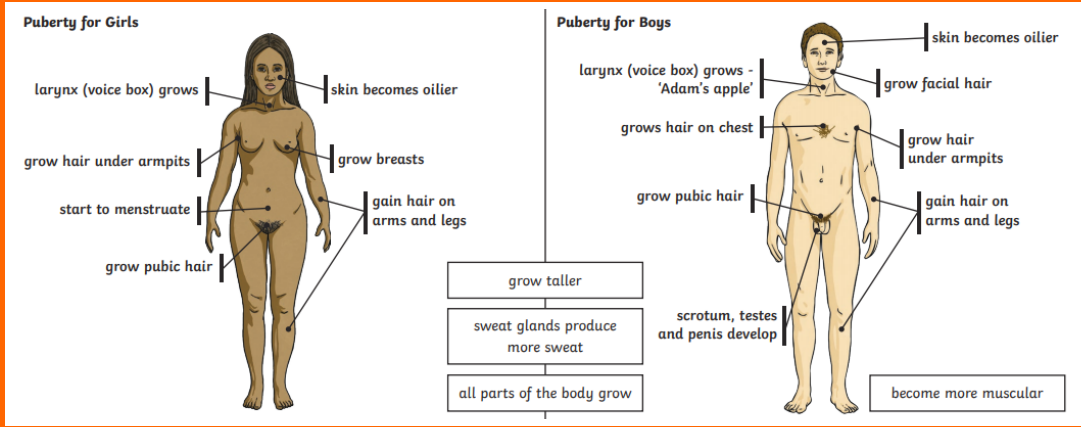
A **thermometer** is the instrument used to tell the air temperature.

A **thermometer** is usually made up of a small, hollow glass tube. At the bottom of the tube is a bulb, which holds a liquid such as alcohol or mercury. When there is an increase in heat, the liquid inside the bulb expands, pushing up into the tube.

There are two scales on a thermometer; Fahrenheit and Celsius (centigrade).



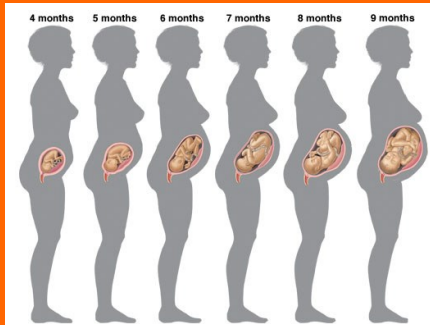
Physical changes in girls and boys



Can you explain the changes I will go through from birth up to my first birthday?



Gestation



Gestation is the period of time that a mammal carries her offspring, or babies, inside her body before giving birth.

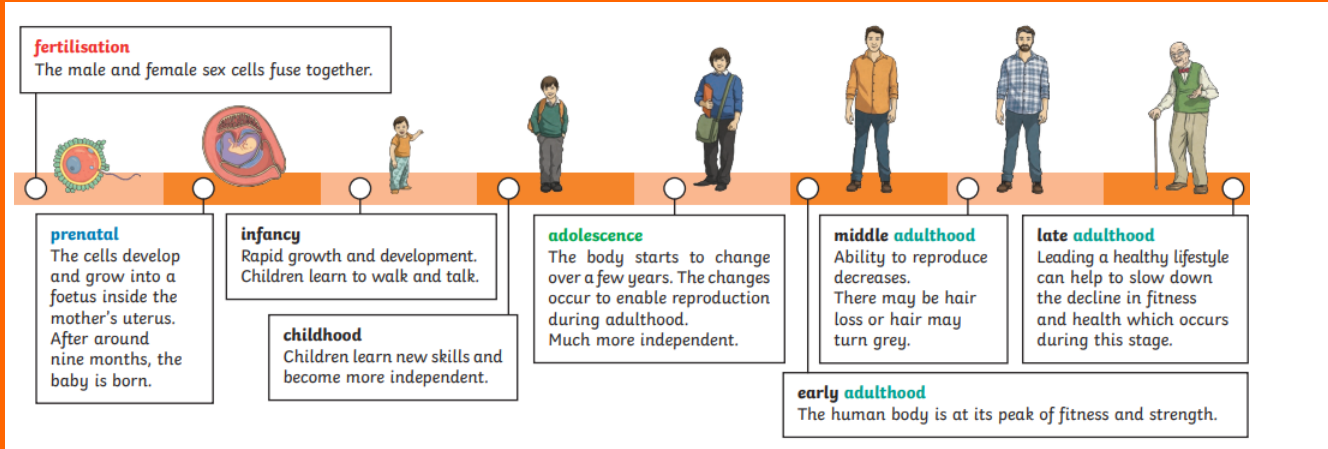
Human gestation lasts for about 9 months.

Family Characteristics

We belong to a family. Although each member of the family is different, there might be similar characteristics between us.



Human lifecycle



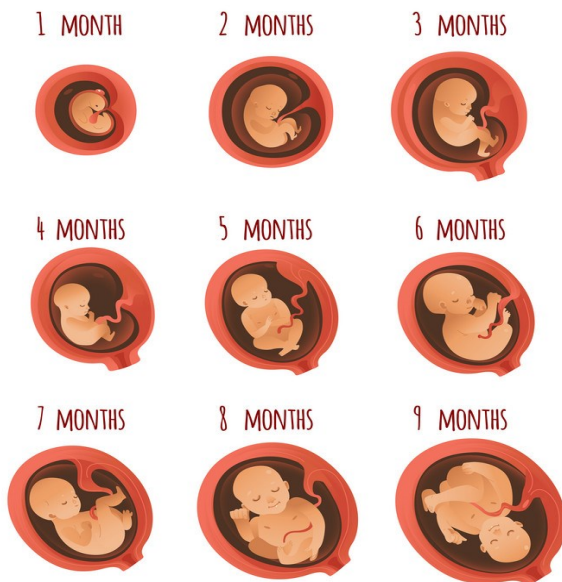
Subject Specific Vocabulary

offspring	A child or animal that has come from its parents
baby	A human that has recently been born and is dependant on its parents for survival.
child	A young human who is learning all about the world and developing skills for later life.
teenager	A human who falls between the ages of 13 to 19 years old.
adolescent or adolescence	This is the name for the transition period from childhood to adulthood
adult	A fully grown human being.
sexes	Living things can be divided according to their roles in reproduction and which consist of males or females.
puberty	This is the name for the time when human bodies begins to develop and change as they move from teenager to adult.
pregnancy	This is the name given to carrying one or more unborn offspring in the body.
gestation	This is the period of time that a mammal carries her offspring inside her body before giving birth.
Life cycle	Life cycle means the stages a living thing goes through during its life.
characteristics	Something that makes someone or a group different to others.

What will I know by the end of this unit?

- Humans have **offspring** that looks like them.
- Humans start life as a **baby**. Then they grow into a **child**. From this they grow into a teenager and an **adolescent**. When they are 18 years old, they become an **adult**.
- Humans develop through these stages and changes occur.
- There are 2 **sexes**; **male** and **female**. We might know them as; boy and girl.
- Boys and girls look different. They have some different parts to one another.
- Bodies go through a process called **puberty**.
- Women have babies. It takes 9 months for a baby to grow inside a woman. This is called **pregnancy**.
- The first year from birth is very important. Babies learn a lot and change a lot during this time.

The growth of a baby



Science

Year 5

Topic: Animals including Humans_Growth and Changing

Strand: Biology

What should I already know?


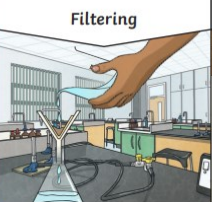

- Living things change over time.
- Living things can grow, eat, move, breathe, reproduce and have senses.
- Humans have a life cycle.
- Humans can reproduce and have offspring known as babies.

Scientific Skills

- Ask questions about life cycles and changes that happen to the body.
- Research facts about the body.
- Create a timeline of the changes in the growth of humans.
- To explain the changes in the physical development of the sexes.
-

Reversible changes

When you mix solids and liquids together, it can be reversed by:

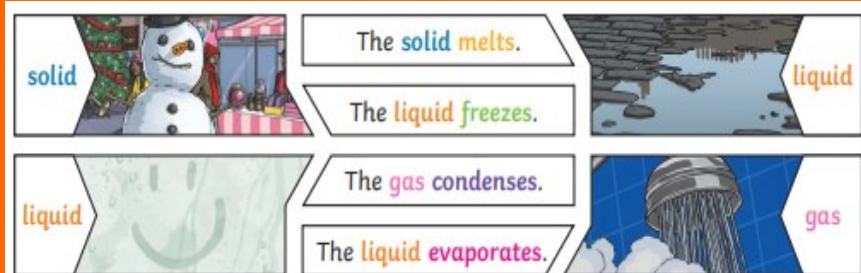
Sieving	Filtering	Evaporating
		
Smaller materials are able to fall through the holes in the sieve, separating them from larger particles	The solid particles will get caught in the filter paper but the liquid will be able to get through.	The liquid changes into a gas and leaves the solid particles behind.

Irreversible changes

Irreversible changes often mean that a new product is made from the original material. It changes and can't be changed back.



Changes of state



Subject Specific Vocabulary

materials	The substance that something is made out of.	evaporating	This is when a liquid turns into a gas or vapour.
solids	One of three states of matter. Solid particles are very close together so that solids hold their shape (wood or glass).	condensing	This is when a gas such as water vapour cools and turns into a liquid .
liquids	This state of matter can flow and take the shape of a container (water and milk). The liquid particles are loosely packed together.	conductor	This is a material that allows energy to travel through it such as metal allows electricity to travel through it. Metal is also a thermal conductor.
gases	This state of matter has particles that are further apart and the gas particles are free to move around. Examples are oxygen and helium.	insulator	This is a material that doesn't let heat or electricity travel through. Wood and plastic are good insulators .
melting	This is the process of heating a solid until it changes into a	transparency	A transparent object lets light through and you can see through it.
freezing	This is the process of when a liquid cools down and turns into	translucent	A translucent object lets light through but you can't see the detailed shape.

Can you find out about how chemists have created new materials?

Find out about Spencer Silver? He invented the glue for sticky notes.

Or find out about Ruth Benerito? She invented wrinkle-free cotton.



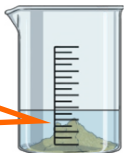
Dissolving

A **solution** is made when solid particles are mixed with a liquid.

Materials that won't dissolve are known as **insoluble**.

Materials that will dissolve are known as **soluble**.

Sand is an **insoluble** material.



Sugar is a **soluble** material.



What will I know by the end of this unit?

- A thermal conductor allows energy in the form of heat to travel through a material.
- An electrical conductor allows energy in the form of electricity to travel through the material.
- Insulators don't allow any energy to travel through the material.
- Some materials can be soluble in water. This means it can disappear when put in water.
- Some materials can be insoluble in water. This means it will not disappear when put into water. It stays solid.
- Materials can be separated through the processes of filtering, evaporation and sieving.
- Some materials have reversible changes which means it can change back to how it was before.
- Some materials have irreversible changes which means it can not change back to how it was

How materials can be changed



Properties and Changes of Materials

Science

Year 5

Topic: Properties and changes of materials

Strand: Chemistry

What should I already know?

- name different types of materials.
- describe what materials feel and look like.
- explain why objects are made from certain materials and not other materials.
- know what magnetism is.
- know which materials are conductors of electricity and which are not.

Scientific Skills

- Ask questions about materials, and how materials behave.
- Sort and classify materials.
- Plan a comparative or fair test.
- Make predictions.
- Observe carefully.
- Measuring accurately using standard units.
- explain my conclusions and understanding using written explanations, diagrams and labels as well as using charts and graphs.

Solids, Liquids and Gases



What will I know by the end of this unit?

- The **Sun**, **Earth** and **Moon** as approximately **spherical** in shape.
- Name and order the **planets** of our **solar system**.
- The Earth **rotates** on an **axis**. It takes 365 **days** or 1 **year** for the Earth to rotate all the way round.
- The Earth's **rotation** creates seasons.
- The Moon travels around the Earth. It takes the moon 24 **hours** to travel around the Earth. This movement makes **day and night**.
- Earth and the other planets in the solar system **orbit** the sun.
- The sun appears to move across the sky throughout the day. This is due to the Earth's movements. The sun stays still.
- The moon can look different shapes through the **month**. Each **phase** of the moon has a special name.

The phases of the moon



Science

Year 5

Topic: Earth and Space

Strand: Physics

What should I already know?

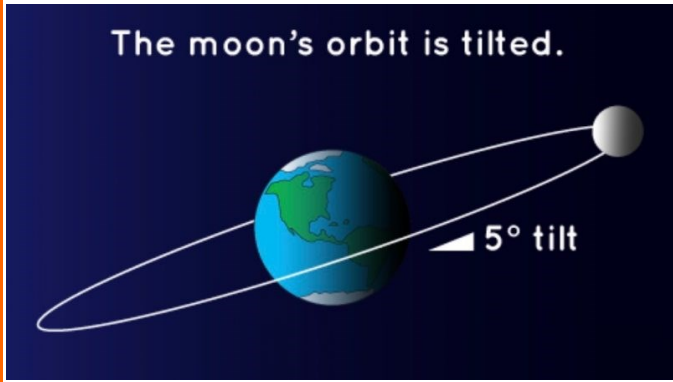
- There are four seasons.
- Each season is very different.
- The weather in each season is different.
- Day length varies in each season.
- The Earth is spherical.
- There is a moon close to Earth.
- There are planets and stars in space.

Scientific Skills

- Ask questions about Earth, the planets and space.
- take accurate measurements using a range of scientific equipment.
- record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- report what I have found out using scientific language, labelled diagrams, tables and graphs.
- identify scientific evidence that has been used to support or refute ideas or arguments.

The moon's orbit

The Moon orbits the Earth in an oval-shaped path while spinning on its axis. At various times of the month, the Moon appears to be different shapes. This is because as the moon rotates round Earth, the sun lights up different parts of it.



The planets

The first 4 planets closest to the sun, Mercury, Venus, Earth and Mars are rocky planets. They are mostly made up of metal and rock.

The other planets, Jupiter, Saturn, Uranus and Neptune are gas planets. They are mostly made up of the gases, helium and hydrogen, although their cores

The Solar System



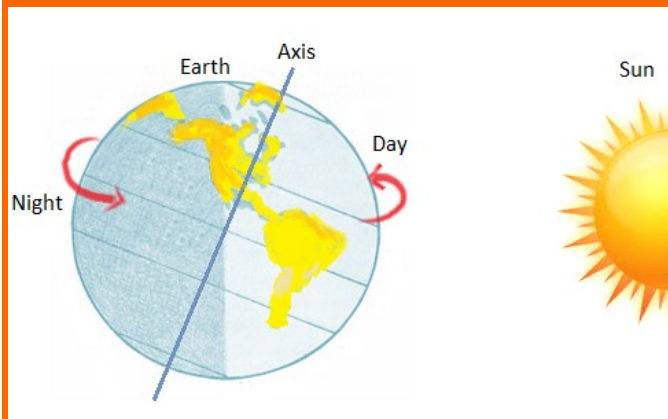
Subject Specific Vocabulary

sun	It is a huge star that Earth and other planets in our solar system orbit around.	satellite	Any object or body in space that orbits something else e.g. the Moon is a satellite of Earth.
Earth	This is the planet that we live on. It is the 4th planet in the solar system.	phase	The phase of the moon is how much of the moon appears to us on Earth to be lit up by the sun.
star	A giant ball of gas held together by it's own gravity.	orbit	This means to move in a regular, repeating curved path around another object.
moon	This is a natural satellite which orbits earth and other planets.	rotate	This means to spin around
planet	These are a large object, round or nearly round, that orbits a star.	axis	This is an imaginary line that a planet rotates around.
sphere	A round 3D shape like the shape of a ball.	geocentric model	A belief people used to have that other planets and the Sun orbited around Earth.
spherical bodies	Astronomical objects shaped like spheres.	heliocentric model	The structure of the Solar System where the planets orbit the Sun.

Pluto

Pluto used to be considered a planet but was classified as a dwarf planet in

The Earth's orbit



Can you think of a mnemonic to help you to remember the order of the planets in the solar system?

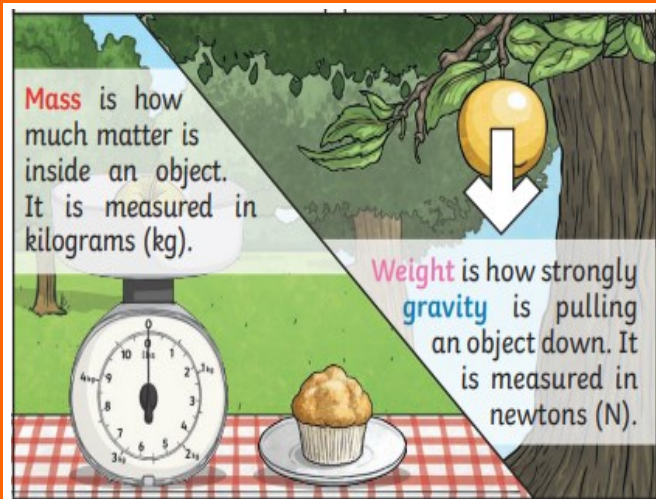
Can you explain how we get day and night?



What will I know by the end of this unit?

- A **force** can **push** or **pull** something.
- **Gravity** is the force that pulls objects down.
- **Friction** is the force between two objects when they move across each other.
- Friction can slow down an object. As a result, heat is produced.
- **Air resistance** is a type of friction that occurs between air and another material. It slows down the **acceleration** of the object towards the earth.
- **Water resistance** is a type of friction that occurs between water and an object. The water pushes against the object and slows down its acceleration.
- **Pulleys, gears** and **levers** are **mechanisms**. Mechanisms help to move things.

Weight and Mass



Science

Year 5

Topic: Earth and Space

Strand: Physics

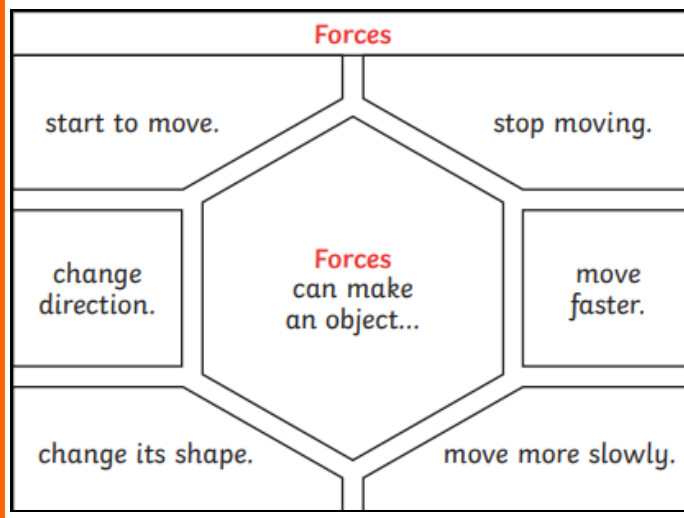
What should I already know?

- Objects move differently on different surfaces.
- Some forces need contact between two objects, but magnetic forces can act at a distance
- Magnets attract or repel each other.
- Magnets attract some materials and not others.
- Know some magnetic materials.
- Magnets have two poles.

Scientific Skills

- Ask questions about forces.
- Predict whether two magnets will attract or repel each other, depending on which way the poles are facing.
- Make careful observations.
- Take accurate measurements
- Record results using scientific diagrams and labels, tables, and scatter graphs.
- Report and present what I have found out in written forms.
- Identify scientific evidence that has been used to support or refute ideas or arguments
- Explain the force of gravity acting between the Earth and the falling object

Forces can make an object...



Gravity.



Gravity is the force that makes things fall to the ground. Gravity also holds the Earth and the other planets in their orbits around the Sun.

Subject Specific Vocabulary

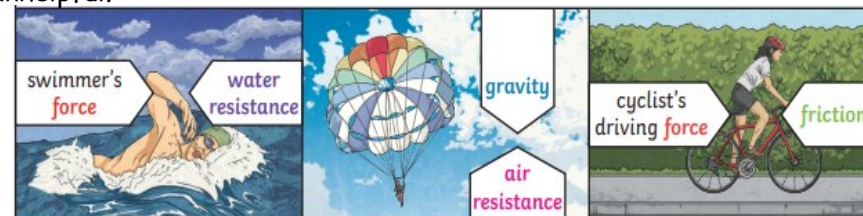
forces	A force is a push or a pull in a certain direction. Force gives an object the energy to move, stop moving or change	Earth's gravitational pull	The pull that Earth exerts on an object, pulling it towards Earth's centre. It is the Earth's pull which keeps us on the ground.
gravity	This is a pulling force. It is exerted by the Earth	Water resistance	A type of friction caused by water pushing against any moving object.
Air resistance	A type of friction caused by air pushing against any moving object	buoyancy	An upward force that a liquid applies to objects
weight	This is the measure of the force of gravity on an object	streamlined	When an object is shaped to minimise the effects of air or water resistance.
mass	This is a measure of how much matter (or stuff) is inside an object.	mechanism	Parts which work together in a machine. Examples of mechanisms are pulleys, gears and levers.
friction	A force that acts between surfaces or objects that are moving, or trying to move across each other.		

Mechanisms

Pulleys	Gears/Cogs	Levers
Pulleys can be used to make a small force lift a lighter load. The more wheels in a pulley, the less force is needed to lift a weight .	Gears or cogs can be used to change the speed, force or direction of a motion. When two gears are connected, they always turn in the opposite direction to each other.	Levers can be used to make a small force lift a lighter load. A lever always rests on a pivot.

Forces in action

Water resistance and air resistance are forms of friction. Friction is sometimes helpful and sometimes unhelpful. Air resistance is helpful as it stops the skydiver hitting the ground at high speed. Friction on a bike chain can make the bike harder to pedal so it is unhelpful.



Can you explain what a force is?



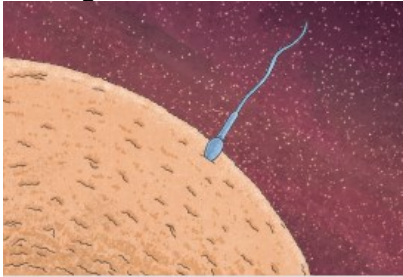
Reproduction in mammals

Mammals use **sexual reproduction** to produce their offspring.

The male sex cell, called the **sperm**, fertilise the female sex cells (egg).

The fertilised cell divides into different cells and forms a baby with a beating heart.

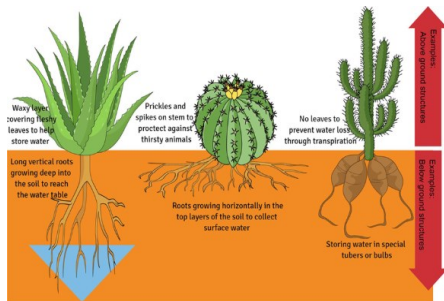
The baby grows inside the female until the end of the **gestation** period when the baby born.



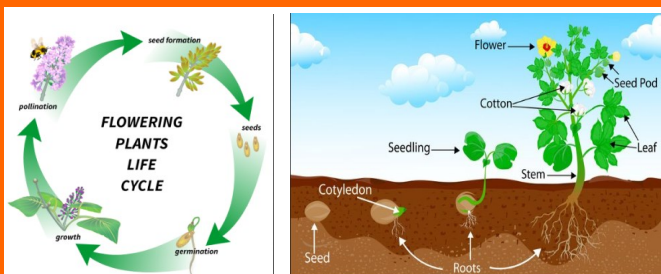
Different plants

Many different plants grow in different places around the world depending on the climate and landscape.

They have adapted and are able to live in sometimes harsh conditions.



Life cycle



Subject Specific Vocabulary

reproduction	This is the process of new living	pollen	This is the male part of a plant. It is a yellow powder like substance.
asexual reproduction	One parent is needed to create an offspring, which is an exact copy of the parent.	ovule	This is the female part of a flower. It contains the seed.
sexual reproduction	Two parents are needed to make an offspring which are similar but not identical to the parent.	sperm	This is the male human part that fertilises the female human part.
fertilise	The action of joining male and female cells to develop an egg.	egg	This is the female human part that is fertilise by the sperm.
gestation	This is the length of a pregnancy.	vertebrate	This is an animal that has a backbone.
life cycle	The journey of changes that take place thorough the life of a living thing.	invertebrate	This is an animal that hasn't got a backbone
metamorphosis	This is a change in the structure		

Asexual reproduction in plants

Some plants, such as strawberry plants, potatoes, spider plants and daffodils use **asexual reproduction** to create a new plant.



They are identical to the parent plant.



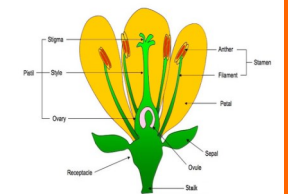
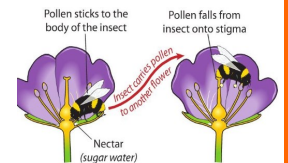
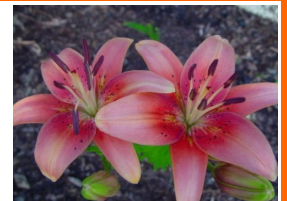
Sexual reproduction in plants

Most plants contain the male sex cell (pollen) and the female sex cell (ovule), but most plants can't fertilise themselves.

Wind, animals and insects help to take pollen to a different plant.

The pollen from the stamen of one plant is transferred to the stigma of another.

The pollen then travels down a tube through the style and fuses with the ovule.



What will I know by the end of this unit?

- A flower has male part called a **pollen** and female part called an **ovule**, and these are used in the process of **reproduction**.
- Most flowers cannot **pollinate** themselves and need bees and other insects to transport the **pollen**.
- Plants are able to reproduce in two different ways - **asexual** and **sexual** reproduction.
- **Sexual reproduction** involves pollen from one flower fertilising the egg of another.
- Some animals undergo a process called **metamorphosis**. This means they change their whole appearance.
- **Mammals, birds, insects** and **amphibians** have different stages in their **life cycles**.
- Know about Jane Goodall and her work with chimpanzees in Africa.

Animals

Animals can be classified into two main groups: **vertebrates** (animals with a backbone) and **invertebrates** (animals without a backbone).

Vertebrates include:

Amphibians - live on land and in water. They lay their eggs in water.

Reptiles - live in water and on land. They have scales and are cold-blooded. They lay eggs on land.

Mammals - usually have hair or fur. Mammals give birth to babies. The mothers feed their babies milk.

Fish - live in water. They have fins instead of legs and gills instead of lungs. They lay their eggs in water.

Birds - have a beak, wings, feathers and 2 legs. They lay eggs.

Invertebrates include:

Insects - have 6 legs. Their bodies are made up of 3 parts. Some have wings. They lay eggs.

Arachnids - have 8 legs. Their bodies are covered in a hard exoskeleton. They lay eggs.

Molluscs - live on land or water. They have a soft body

All Living Things and Their Habitats

Science

Year 5

Topic: Living things and habitats

Strand: Biology

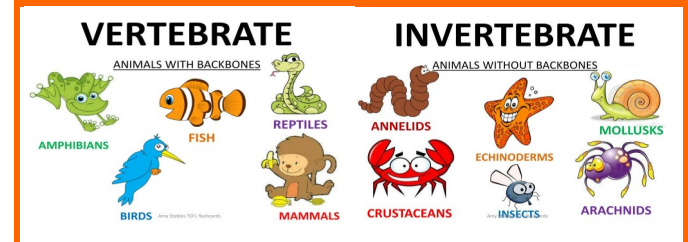
What should I already know?

- Explain different types of seed dispersal.
- Explain the life cycle of flowering plants.
- Mammals are warm blooded animals that give birth to live young, make milk for their young and they have hair.

Scientific Skills

- identify, classify and describe living things.
- compare the life cycles of different plants and animals.
- Make observations
- Measure accurately using standard measures
- report and present findings from enquiries using written explanations, diagrams and labels, classification keys and tables.

Animal Classification



Key Images and



amphibians



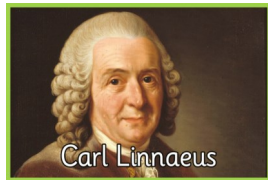
invertebrates



echinoderm



crustaceans



Carl Linnaeus



birds



arachnids



annelids

Subject Specific Vocabulary

micro-organisms	a microscopic organism, especially a bacterium, virus, or fungus.	classification system	A collection of procedures, characteristics, and definitions used to classify and/
fungus	any of a group of spore-producing organisms feeding on organic matter, including moulds, yeast, mushrooms, and toadstools.	monera	<i>Monera</i> is a kingdom that contains unicellular organisms without a nucleus, such as
bacteria	A member of a large group of unicellular microorganisms which have cell walls but lack organelles and an organized nucleus, including some which can cause disease.	vertebrates	An animal of a large group distinguished by the possession of a backbone or spinal column, including mammals, birds, reptiles, amphibians, and fishes.
viruses	A <i>virus</i> is a small infectious agent that replicates only inside the living cells of an organism.	invertebrates	An animal lacking a backbone, such as an arthropod, mollusc, annelid, coelenterate, etc. The invertebrates constitute an artificial division of the animal kingdom, comprising 95 per cent of animal species.
spores	A reproductive body that is produced by fungi and by some plants and microorganisms and consists of a single cell able to produce a new individual.	Carl Linnaeus	Carl Linnaeus was a Swedish scientist who believed it was very important to have a
air-born	A method that causes viruses to spread.	cells	The cell is the smallest unit with the basic properties of life. Some tiny organisms, such as bacteria and yeast, consist of only one cell . Large plants and animals have many billions of cells .
microscopic	So small as to be visible only with a microscope.		

Beach	Silver	Lyme	Oak
Maple	Sycamore	Conifer	Ever green
smallpox	virus	treatment	prevention

How would you classify these items?



Scientists need to use a standard recognised method for classifying living things. Do you know any of the ways they do this?



Scientific Skills

In this unit, Year 6 children will:

- ask questions and develop a line of enquiry based on observations.
- make predictions using scientific knowledge and understanding.
- observe and make accurate measurements using a range of methods for different investigations.
- use and develop keys and other information records to identify, classify and describe with increased accuracy.
- select, plan and carry out the most appropriate types of scientific enquiries to test predictions.
- suggest improvements to plans and explain the reasons why.
- present observations and data using appropriate methods
- interpret observations and data, including identifying patterns and data to draw conclusions.
- present and evaluate reasoned explanations, including data in relation to predictions and hypotheses.
- identify further questions arising from results to make predictions to set up further comparative tests.

Additional Information

Viruses are the smallest of the microbes and are generally harmful to humans. Viruses cannot survive by themselves. They need a 'host' cell in order to survive and reproduce. Once inside the host cell, they rapidly multiply and destroy the cell in the process!

Bacteria are single-celled organisms that, under the right conditions, can multiply once every 20 minutes. During their normal growth, some produce substances (toxins) which are extremely harmful to humans and cause disease. Others are completely harmless to humans, and others can be extremely useful to us (e.g. Lactobacillus in our food).

Carl Linnaeus was a Swedish scientist who believed it was very important to have a standard system of classification. At the time he was alive, in the 1700s, there was no agreed standard method.

Linnaeus collected and examined over 40,000 specimens of plants, animals and shells. In 1735, he published his first edition of 'Systema Naturae', which described his system for classifying living things.

Living Things and Their Habitats



What should I already know?

Year 6 children will build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They will be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided.

What will I know by the end of this unit?

- I will be able to identify micro-organism (fungi) in the local area.
- I will investigate the best conditions for fungi (micro-organism) to thrive.
- Classify micro-organisms in the local area into broad groups based on similarities and differences.
- Explore the differences between bacteria and viruses.
- Explore how some bacteria is helpful and some is harmful.
- Classify by subdividing micro-organisms
- Describe how living things are classified into broad groups based on observable characteristics
- Create an animal classification system with a key whilst explaining reasons why.
- Classify animals as vertebrates and invertebrates into broad groups in the local area, describing reasons why.

What will I know by the end of this unit?

- the **circulatory system** comprises of the **heart**, **lungs** and **blood vessels**.
- Water and **nutrients** are **absorbed** by the **intestines** and are carried into the blood stream.
- Nutrients are absorbed by **cells** that need them.
- Water is absorbed by all cells.
- The **kidneys** and **colon** are responsible for waste.
- A healthy diet is important to prevent your body from performing poorly and becoming infected or **fatigued**.
- Exercise benefits **physical health**, **emotional health** and **social health**.
- A drug is a **chemical** that has an effect on the body. Some drugs are medicines to make people healthy. Others are known as illegal drugs. They can have a dangerous effect on our health.

Scientific Skills

- ask questions about the circulatory system and how the body functions.
- Sort and classify objects using a criterion.
- Set up a comparative or fair test.
- Predict what will happen.
- Make careful observations.
- Measure accurately using standard units
- Explain which variables will be controlled.
- Use written explanations, models and labelled diagrams as well as tables and graphs to report on my findings.
- Explain how the circulatory system works.
- Explain the impact poor health can have on the body.



Science

Year 6

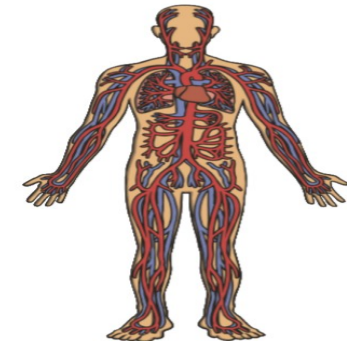
Topic: Animals including humans

Strand: Biology

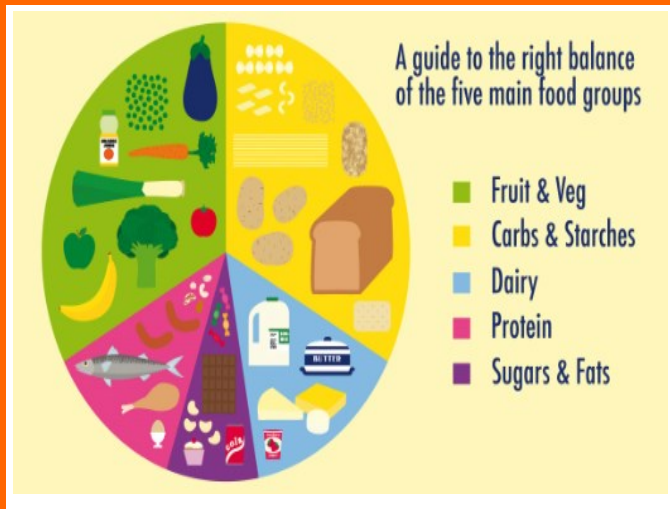
What should I already know?

- we need to eat a healthy diet.
- we can not make our own food.
- we get nutrition from what they eat.
- food chains show the order in which living things rely on one another for food.
- a producer makes food.
- a predator eats the food.
- prey is the thing being hunted.
- humans and some animals have skeletons and muscles to support them, protect them and to help them to move.
- explain the simple functions of the basic parts of the digestive system in humans.
- humans grow and develop during their lifetime.

The circulatory system



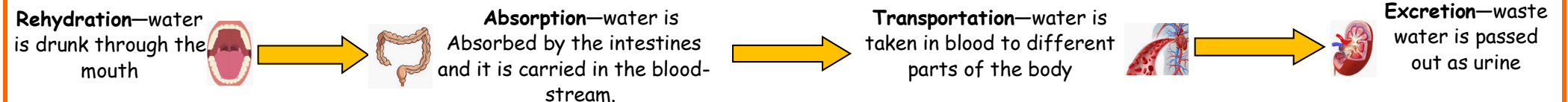
A balanced food plate



Why should we exercise?



Transportation of water in the body



Subject Specific Vocabulary

Circulatory System	The system that transports blood through the whole body.	Chemical	This is a substance that cannot be broken down without changing it.
Heart	The organ that pumps blood.	Legal	This is something we are allowed to do.
Lungs	The organ that breathes in air.	Illegal	This is something we are not allowed to do.
Blood Vessels	Tubes that carry blood through the tissues and organs.	Intestines	This is a tube that runs from the stomach all the way to where waste is released.
Artery	A tube that takes blood filled with oxygen from the heart.	Absorbed	This means taken in or soaked up.
Vein	A tube that carries blood without oxygen back to the heart.	Cells	This is the smallest unit of life.
Nutrients	This is what living things need to grow.	Kidney	These are a pair of organs that excrete urine.
Digestive	This is the process of the breaking down food by the body.	Colon	This is an organ that removes water from digested food.

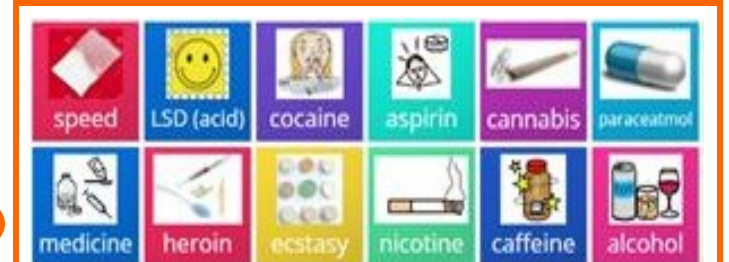


Joe Wicks wants to get children across the world up and moving.

He says it isn't just all about keeping your body fit, it is about keeping your mind happy and healthy too.

"Never give up. Believe in yourself. And keep grafting!"

Legal or illegal?



What will I know by the end of this unit?

- The amount of **cells** in a **circuit** affects the brightness of a bulb.
- The **voltage** of the cells can affect the brightness of a bulb.
- The difference between a series circuit and a parallel circuit.
- Adding or removing of a **components** in a circuit can affect the rest of the circuit.
- **Renewable energy** is an energy source that is not 'used up' such as solar power.
- **Non-renewable energy** is an energy source that is 'used up' such as **fossil fuels** like coal.

Scientific Skills

- Ask questions about electricity.
- Research facts and information about the electricity.
- Explore and investigate adding or removing components in a circuit and explain the affect this has on the rest of the circuit.
- Explain why a circuit will or will not work using scientific language.
- Give reasons for variations in how components function, such as the brightness of bulbs, the loudness of buzzers and the on/off position of switches.
- Plan different scientific enquiries to answer questions.
- Make careful observations and take accurate measurements.
- Record data using scientific diagrams and labels, as well as using tables and graphs.
- Report and present what I have found out orally and in written forms.

Electricity

Science

Year 6

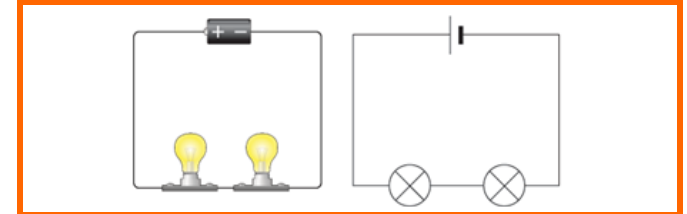
Topic: Electricity

Strand: Physics

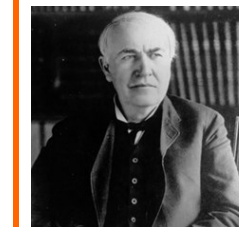
What should I already know?

- common appliances that use electricity
- Components of a series circuit.
- A switch opens and closes a circuit.
- Electricity is dangerous and electricity should be used safely and appropriately.
- Know some common conductors and insulators of electricity.
- Know metals are good conductors.

A series circuit

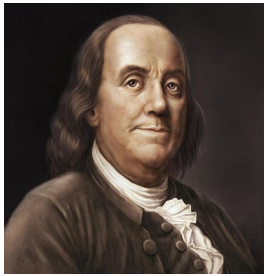


Thomas Edison



Thomas Edison showed that when electric current flowed through wires, their resistance caused them to heat up to the point where they gave out light.

Benjamin Franklin



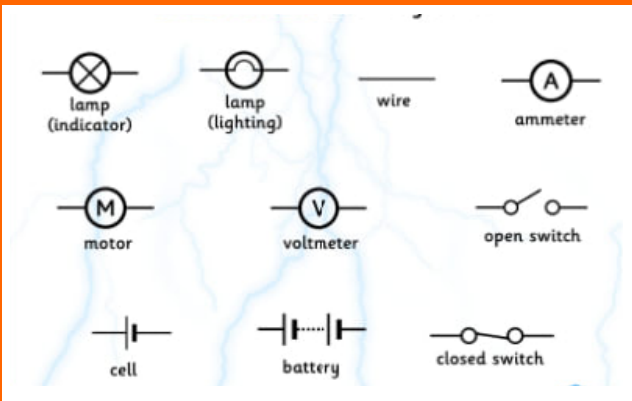
Most people give credit to Benjamin Franklin for discovering electricity.

Benjamin Franklin had one of the greatest scientific minds of his time.

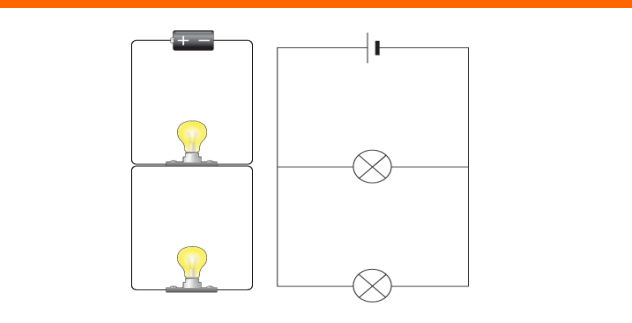
He was interested in many areas of science, made many discoveries, and invented many things, including bifocal glasses.



Circuit symbols



A parallel circuit

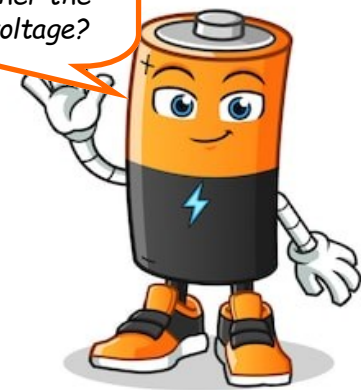
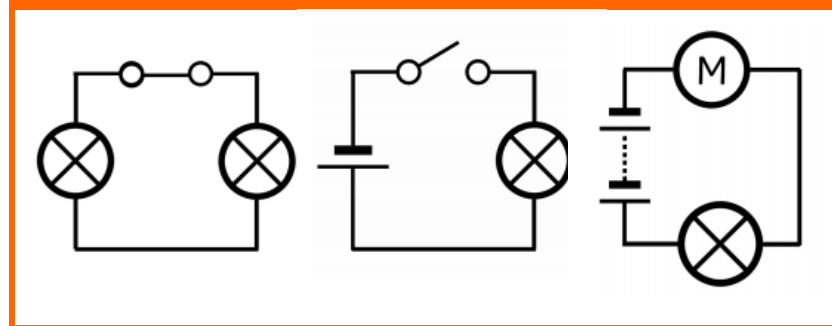


Subject Specific Vocabulary

cell	A device used to generate electricity.	insulator	A material that doesn't allow electricity to travel through it.
circuit	This is an electrical path that enables electricity to flow around.	conductor	A material that allows electricity to travel through it.
voltage	This is the force that makes the electricity travel through wires. It is measured in volts.	Renewable energy	This energy source that will never run out. These include solar power, wind power, hydro power and nuclear power
components	This is an electrical element such as a bulb, buzzer or motor that can be connected together to make a circuit.	Non-renewable energy	This energy source will eventually run out. It will no longer be able to used to make electricity. These include fossil fuels such as coal, oil and natural gas.
current	This term is used to describe the movement or the flow of electricity around a circuit.	Positive and negative charge	Protons and electrons are the only two parts of the atom with an electric charge. Protons have a positive charge. Electrons have a negative charge .
resistance	The difficulty of passing the electrical current around the circuit.		
electrons	This is the smallest electrical charge.		

If I wanted a buzzer to make a louder sound, would I need to lower or higher the amount of voltage?

Which circuit will work? Why? Why not?



What will I know by the end of this unit?

- **Living things** have changed over time.
- Animals and plants have **adapted** to suit their **environment** in different ways.
- Living things produce **offspring** of the same kind. However, normally offspring vary and are not identical to their parents.
- Living things can **inherit characteristics** and **traits** from their parents.
- Living things can learn ways in which to **adapt** their traits in order to **survive**.
- Within one species there will be lots of **variation**. Not every one in that species will look **identical**.
- Know **adaptation** leads to **evolution**.
- **Fossils** provide information about living things that **inhabited** the Earth millions of years ago

Evolution of humankind



Variation



Science

Year 6

Topic: Evolution and Inheritance

Strand: Biology

What should I already know?

- Living things are alive. They can move, breathe, reproduce, grow, eat and have senses
- People change over time.
- That children can look like their parents or other siblings.
- Animals live in an environment. This environment provides for them everything they need in order to survive.
- There are different types of rocks.
- Explain how fossils are formed.

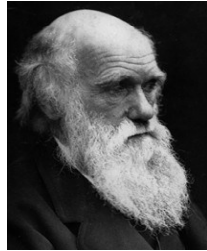
Scientific Skills

- Ask questions about adaptation and inheritance.
- Research theories by Charles Darwin, Alfred Wallace or Mary Anning.
- Make careful observations.
- Take accurate measurements.
- Report what they have found out.
- Record using scientific language, labelled diagrams, tables and charts what they have found out.
- Explain what adaptation and inheritance is.
- Talk about family traits.

Charles Darwin

Charles Darwin was most famous for his work on natural selection, the idea that all species of life have evolved over time from common ancestors.

This process involves the wanted traits becoming more common in the next generation of living things while at the same time unwanted traits become less common.



Fossilisation

When 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; 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. Erosion and weathering take place and eventually the fossil becomes exposed. This is how many scientists have uncovered our past.



Can you explain what adaption is?



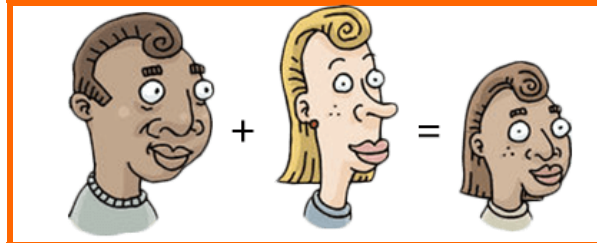
Do you have any family traits?

Do you have any characteristics that are similar to other family members?

Subject Specific Vocabulary

offspring	This is the young animal or plant that is produced by the reproduction of that species.	inherited traits	These are traits you get from your parents. Within a family, you will often see similar traits, e.g. curly hair.
inherit or inheritance	This is when characteristics are passed on to offspring from their parents.	habitat	This is an area or place in which particular animals and plants can live.
variations	The differences between individuals within a species.	environment	It contains many habitats and includes areas where there are both living and non-living things.
characteristics	These are distinguishing features or qualities specific to each individual or species.	evolution	This is when adaptation happens over a very long time.
adaptation	This is a trait (or characteristic) changing to increase a living thing's chances of surviving and reproducing.	natural selection	This is a process where organisms that are better adapted to their environment tend to survive and produce more offspring.
adaptive traits	These are genetic features that help a living thing to survive.	fossil	These are remains or imprints of a prehistoric plant or animal embedded in rock and preserved.

Heredity



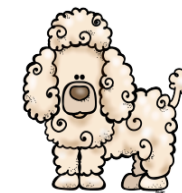
Heredity

Labradoodle

A crossbreed is a dog of mixed inheritance, whose parents are of two different breeds. Crossbreeds often display a mixture of their parents' characteristics like this Labradoodle.



Labrador



+ Poodle

=



Labradoodle

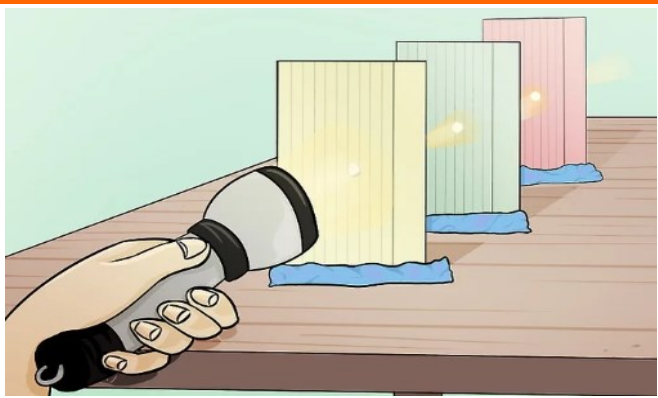
What will I know by the end of this unit?

- **Light** travels in straight lines. These lines are known as **rays** or **beams of light**.
- Objects are seen because they give out or **reflect** light from the object to our eye.
- Light is made up of lots of colours.
- **Light waves** travel from a **light source**.
- Unlike water and sound waves, light waves does not need anything to travel through.
- Light travels through a **vacuum**.
- **Shadows** have the same shape as the object.
- Shadows can be **elongated** or shortened depending on the angle of the light source.

Sources of light



Light travels in straight lines



Science

Year 6

Topic: Light

Strand: Physics

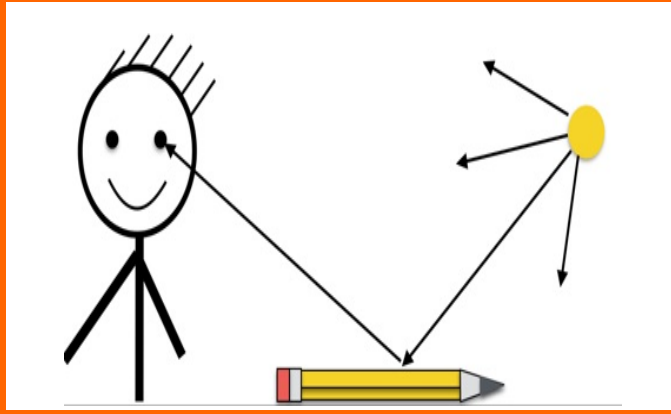
What should I already know?

- We need light to see things.
- Dark is the absence of light.
- Light is reflected from surfaces.
- Light from the sun can be dangerous and that I must protect my eyes.
- Shadows are formed when the light from a light source is blocked by a solid object.

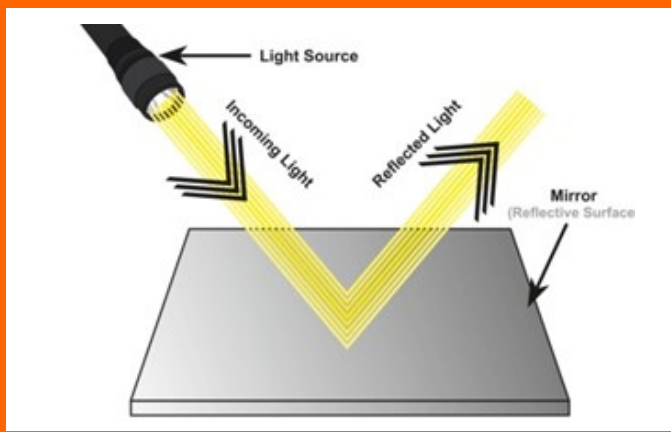
Scientific Skills

- Ask questions about light and how we see.
- Research facts and information about the eye.
- Explore and investigate how refraction changes the direction in which light travels.
- Plan different scientific enquiries to answer questions.
- Make careful observations.
- Take accurate measurements.
- Record data using scientific diagrams and labels, as well as using tables and graphs.
- Report and present what I have found out orally and in written forms.
- Research Sir Isaac Newton's and find out about his experiments on light and colour.
- Research Periscopes. Using research, design and make an periscope.

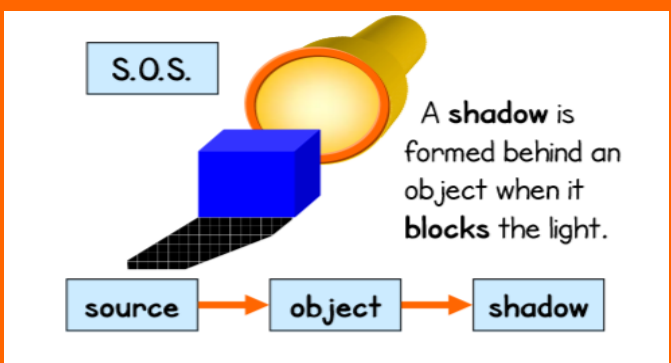
Light enters our eye so we can see objects



Law of reflection



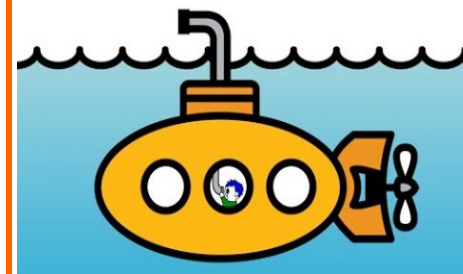
Remember S.O.S



Subject Specific Vocabulary			
light	The natural agent that makes things visible.	Refraction	When light changes direction as a result of travelling at different speeds.
source	The place from which light comes from.	Focal point	The point at which rays meet after reflection or refraction.
ray or beam of light	The straight line in which light travels.	Transparent	Allowing light to pass through.
vacuum	A space where the air has been removed.	Opaque	Not able to be seen through.
reflection	The throwing back by a surface of light.	Cast	Cause (light or shadow) to appear on a surface
incidence	The point in which a light meets with a surface.	Spectrum	A band of colours, as seen in a rainbow.
Periscope	An apparatus consisting of a tube attached to a set of mirrors or prisms, by which an observer can see things that are otherwise out of sight.	Prism	A 3D shape like in Mathematics.
Absorb	To take in or soak up.	Wavelength	This is a range of energy from gamma rays to radio waves. It includes x-rays, ultra-violet rays and infrared.

Periscopes

Periscopes were used by the Navy.
Do you know how they work?



In 1672, Isaac Newton discovered that white light was made up of many different colours.

The **Newton Colour Disc** is the way to prove that white light is a combination of the seven colours found in the rainbow.

"If I have seen a little farther than others, it is because I stand on the shoulder of giants."

Sir Issac Newton

