

Year 4 States of matter- Autumn 1 Term Knowledge Organiser

What should I already know?

Year 2/3 skills of comparing and grouping materials together based on their properties

How has the river Humber affected life in our area?

Key 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.

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.

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.

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.

Water vapour-this is water that takes the form of a gas. When water is boiled, it evaporates into a water vapour.

Melt-this is when a solid changes to a liquid.

Freeze-liquid turns to a solid during the freezing process.

Evaporate-turn a liquid into a gas.

Condense-turn a gas into a liquid.

Precipitation-liquid or solid particles that fall from a cloud as rain, sleet, hail or snow

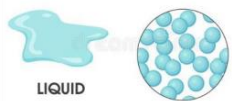
National Curriculum objectives:

- compare and group materials together, according to whether they are solids, liquids or gases
- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius ($^{\circ}\text{C}$)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

SOLIDS
 -Solids hold their shape
 -Solids are rigid
 -Solids have a fixed volume
 Examples include ice cubes, rock, glass and most metals.



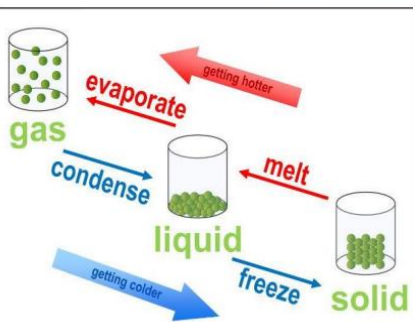
LIQUIDS
 -Liquids do not hold their shape
 -They are not rigid
 -However, they have a fixed volume.
 Examples include water, oil, blood and milk



GASES
 -Gases do not hold their shape
 -They are not rigid
 -They do not have a fixed volume.
 Examples include oxygen, carbon dioxide and helium.



Changing States of Matter



States of matter can change, depending upon the temperature of the matter.

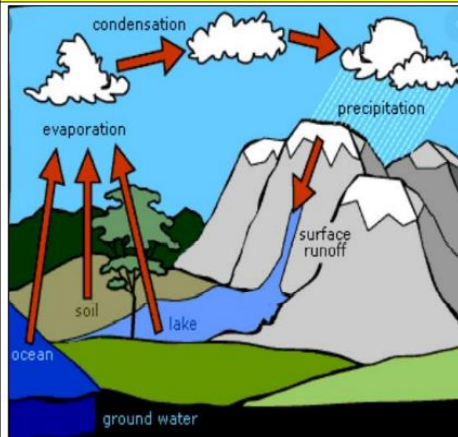
-Melting is the process of changing a solid into a liquid.

-Evaporation is the process of changing a liquid into a gas.

-Condensation is the process of changing a gas into a liquid.

-Freezing is the process of turning a liquid into a solid.

Role in the Water Cycle



Changing states of matter play an important part in the water cycle:

EVAPORATION

Energy from the sun heats up the surface of the Earth. This causes the temperature in rivers, lakes and oceans to rise, and evaporate into the air.

CONDENSATION

As the water vapour rises, it cools in the higher air and turns back into liquid – condensation. This creates clouds.

PRECIPITATION

When too much water has condensed, the clouds become too big for air to hold them. Precipitation occurs.

Year 4 Animals including humans- Autumn Term 2 Knowledge Organiser

What should I already know?

In Year 2, children construct and interpret simple food chains.

How has the river Humber affected life in our area?

Key vocabulary

Digest-break down food so it can be used by the body.

Oesophagus- a muscular tube which moves food from the mouth to the stomach.

Stomach-an organ in the digestive system where food is broken down with stomach acid and by being churned around.

Small intestine- part of the intestine where nutrients are absorbed into the body.

Large intestine-part of the intestine where water is absorbed from remaining waste food. Stools are formed in the large intestine.

Rectum- part of the digestive system where stools are stored before leaving the body through the anus.

Herbivore -an animal that eats plants.

Carnivore- an animal that feeds on other animals.

Omnivore- an animal that eats plants and animals.

Producer-a plant that produces its own food.

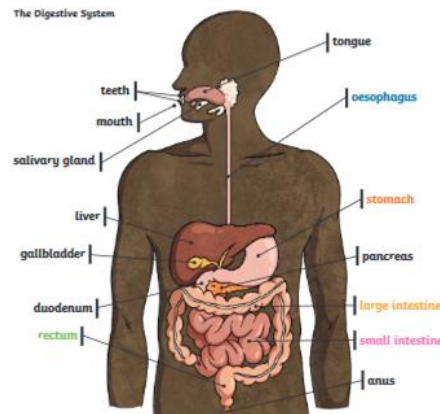
Predator- an animal that hunts and eats other animals.

Prey-an animal that gets hunted and eaten by another animal.

National Curriculum objectives:

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

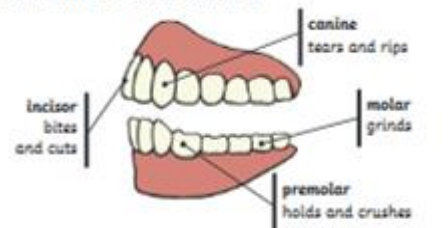
Knowledge:



DIGESTIVE ORGANS AND THEIR FUNCTION

Mouth	teeth reduce to small pieces, liquefy, break down swallow
Oesophagus	transport
Stomach	mix, reduce to small pieces, protein digestion acid protection against bacteria
Small intestine	breakdown of carbohydrates, proteins and fats absorption of nutrients, vitamins, nutrients and water
Large intestine	concentration via removal of water fermentation
Rectum	storing
Anus	excreting

Human Teeth and Their Functions



Some people have wisdom teeth but they have no function now.

Skills and enquiry

Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.

An Example of a Food Chain

The arrows in a food chain show the flow of energy.



Year 4 Sound- Spring Term Knowledge Organiser

What should I already know?

In Year 3, children develop the skill of finding links and patterns. Knowledge from KS1 of our bodies to understand how our ears are used to hear.

Key vocabulary

Vibration- a movement backwards and forwards.

Sound wave- vibrations travelling from a sound source.

Volume- the loudness of a sound.

Amplitude- the size of a vibration. A larger amplitude = a louder sound.

Pitch- how low or high a sound is.

Ear- an organ used for hearing.

Particles- solids, liquids and gases are made of particles. They are so small we are unable to see them.

Distance- a measurement of length between two points.

Soundproof- to prevent sound from passing.

Absorb sound- to take in sound energy. Absorbent materials have the effect of muffling sound.

Vacuum- a space where there is nothing. There are no particles in a vacuum.

Eardrum- a part of the ear which is a thin, tough layer of tissue that is stretched out like a drum skin. It separates the outer ear from the middle and inner ear. Sound waves make the eardrum vibrate.

National Curriculum objectives:

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



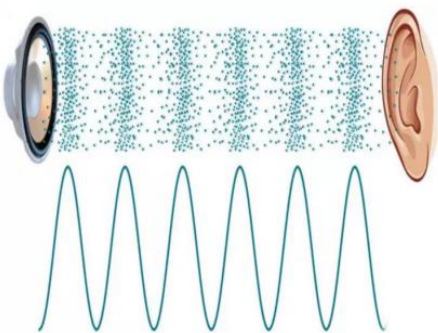
Why did the Vikings and Anglo-Saxons battle for Britain?

The size of the **vibration** is called the **amplitude**. Louder sounds have a larger **amplitude**, and quieter sounds have a smaller **amplitude**.

loud

quiet

How Sounds are Made



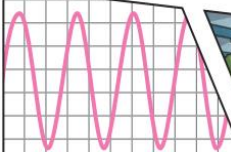
-Sounds are created when something vibrates (shakes back and forth).

-This creates sound waves which travel to the ears of the listener.

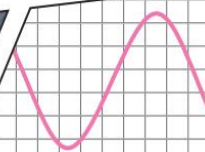
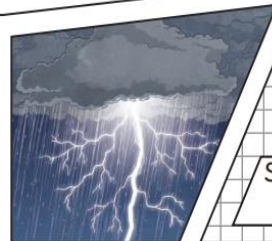
-When a bell is struck, the metal of the bell vibrates. These vibrations create waves in the air (sound waves).

-When they reach our ears, they make our eardrums vibrate, and we hear the sound of the bell ringing.

Pitch is a measure of how high or low a sound is. A whistle being blown creates a high-**pitched** sound. A rumble of thunder is an example of a low-**pitched** sound.



Faster **vibrations** = higher **pitch**



Slower **vibrations** = lower **pitch**

Year 4 Electricity- Summer Term 1 Knowledge Organiser

What should I already know?

In KS1 materials units,, children are able to associate being conductive with metals.

What makes the Earth angry?

Key vocabulary

Electricity-the flow of an electric current or charge through a material, e.g. from a power source through wires to an appliance.

Generate-to make or produce.

Renewable- a source of electricity that will not run out. These include solar, nuclear, geothermal, hydro and wind.

Non-renewable-this source of energy will eventually run out and so will no longer be able to be used to make electricity. These include fossil fuels – coal, oil and natural gas.

Appliances- a piece of equipment or device designed to perform a particular job, such as a washing machine or mobile phone.

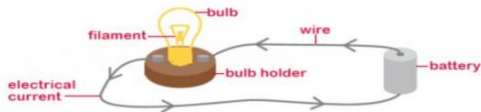
Battery-a device that stores electrical energy as a chemical.

Circuit- a pathway that electricity can flow around. It includes wires and a power supply and may include bulbs, switches or buzzers.

Electrons-small particles with an electric charge

Simple Series Electric Circuits

This diagram shows a battery with wires connecting it to a battery (or cell).



Circuit

-A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow.

Current

-A current is the electricity flowing through the circuit.

Battery (Cell)

-A battery (or cell) is something in which electricity can be stored.

Wire/Cable

-Wires and cables are thin flexible threads that transport electricity.

Conductor/Insulator

-Conductors allow electricity to flow through freely. Insulators do not allow electricity to flow through freely.

National Curriculum objectives:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors.



Creation and Uses of Electricity



Electricity can be created in a number of different ways, for example:

-Burning fossil fuels (oil, gas, etc.) in power stations;

-Using solar power generated from the sun;

-Using wind power from wind turbines;

-Using water power (hydropower).

Electricity is used to power numerous household appliances, for example laptops, TVs, fridges, microwaves, toasters, ovens and lights/ lamps. Life would be very different without it!

Electrical Safety



Electricity can be extremely dangerous if it is not used safely. It can cause burns, shocks, serious injury and (in extreme cases) even death.

There are many electrical dangers, both in the home and outdoors.



Conductors

Silver

Gold

Copper

Steel

Sea Water

Rubber

Glass

Oil

Diamond

Dry Wood

Some Important Electrical Safety Trips

-Do not put fingers and other objects in an outlet;

-Never use anything with a cord or plug around water;

-Keep metal objects away from toasters;

-Stay away from power stations and power lines;

-Never pull a plug out by its cord;

-Never touch or climb trees near power lines;

-Go indoors when there is thunder and lightning.

-Look out for signs like the one on the left.

Insulators

Year 4 All living things- Summer 2 Term Knowledge Organiser

What should I already know?

In Year 2, children learn about habitats and how animals can be classified by their characteristics.

Key vocabulary

Organisms-this is another word that can be used to mean 'living things'.

Life processes-the things living things do to stay alive.

Respiration- a process where plants and animals use oxygen gas from the air to help turn their food into energy.

Sensitivity-the way living things react to changes in their environment.

Reproduction-the process through which young are produced.

Excretion- the process by which living things get rid of waste products.

Nutrition-food which provides living things with energy to live and stay healthy.

Habitat-the specific area or place in which particular animals or plants may live.

Environment-an environment contains many habitats and these include areas where there are both living and nonliving things.

Endangered species-a plant or animal where there are not many of their species left and scientists are concerned that the species may become extinct.

Extinct-when a species has no more members alive on the planet, it is extinct.

Classification-this is where plants or animals are placed into groups according to their similarities.

Vertebrates-animals with a backbone.

Invertebrates-animals without a backbone.

Specimen-a particular plant or animal that scientists study to find out about its species. Characteristics-the distinguishing features or qualities that are specific to a species

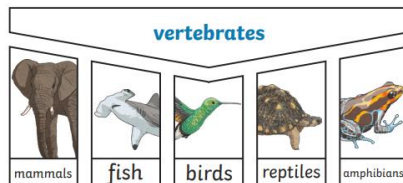
National Curriculum objectives:

- recognise that living things can be grouped in a variety of ways
- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- recognise that environments can change and that this can sometimes pose dangers to living things



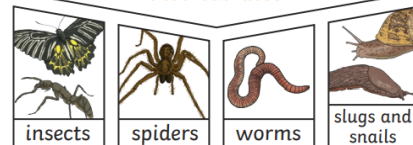
What happened to the Mayans?

Animals can be grouped in lots of different ways based upon their **characteristics**.



Vertebrates can be separated into five broad groups.

invertebrates



You could sort **invertebrates** you might see around school in different ways, such as in this example. The vast majority of living things on the planet are **invertebrates**.

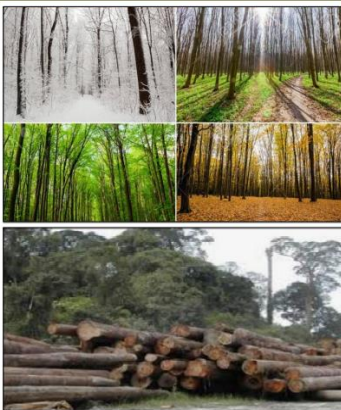
Classification of Animals

M-R-S G-R-E-N

You can remember the seven features of living things by using the acronym MRS GREN (Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition).

Mammals -Mammals are warm-blooded. -They often have hair/fur on their bodies. -Mammals give birth to live young. -Mammals often drink milk from their mothers.	Snails -Snails have shells. -They have a large muscular foot, which secretes mucus. -Their stomach is directly above their muscular foot. -Most snails live underwater.
Reptiles -Reptiles are cold-blooded. -They normally lay eggs (but some don't). -Reptiles have scales or scutes.	Slugs -Slugs do not have shells. -They have a large muscular foot, which secretes mucus. -Their stomach is directly above their muscular foot.
Amphibians -Amphibians are cold-blooded animals. -They have moist, scaleless skin. It is often permeable. -Amphibians lay eggs.	Worms -Worms have long, narrow bodies. -Worms do not have limbs (arms and legs). -They are bilaterally symmetrical (both sides the same).
Fish -Fish are cold-blooded animals. -Fish can breathe underwater, using gills. -Fish lay eggs. -Fins help to propel fish through the water.	Spiders -Spiders have eight legs. -Spiders bodies are made of two main parts. -Spiders create silk from their spinneret glands. -Spiders lay eggs.
Birds -Birds are warm-blooded. -Birds have feathers, wings and a beak. -Birds lay eggs.	Insects -Insects have exoskeletons: hard shell-like coverings of their body. They also have three main body parts. -They have antennae on the top of their heads.

Habitat Changes



Animals are often adapted to the habitats that they live in. However, habitats can change over time, which may present animals and plant life with difficulties.

Some of these changes are natural, e.g:

-The seasons: temperatures rise in the summer and fall in winter. This means that some animals may need to migrate or hibernate.

-Increased or decreased rainfall can also impact on a habitat. Floods and droughts can dramatically impact on environments.

Other habitat changes are man-made, e.g:

-Harvesting fossil fuels, deforestation, dredging rivers, bottom trawling, urbanization, filling in wetlands and mowing fields.

-Global warming is thought to be impacting on many habitats.

Life Processes

To stay alive and healthy, all living things need certain conditions that let them carry out the seven **life processes**:

Movement
Respiration
Sensitivity
Growth
Reproduction
Excretion
Nutrition