Year 4– Science – Autumn 1
States of Matter

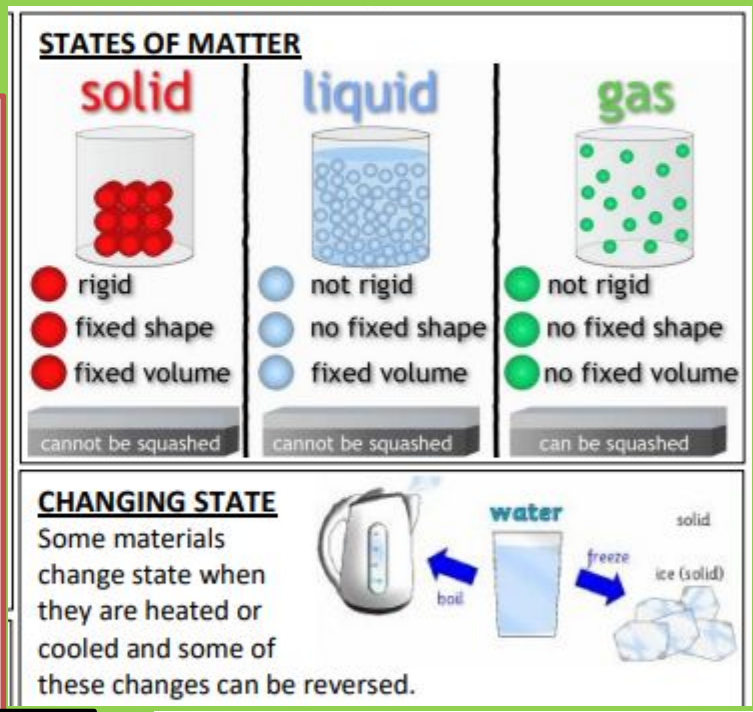
Key Questions:
What is the difference between solids that are soluble and insoluble?

What property do all liquids have that solids do not?

What are the differences between solids, liquids and gases?

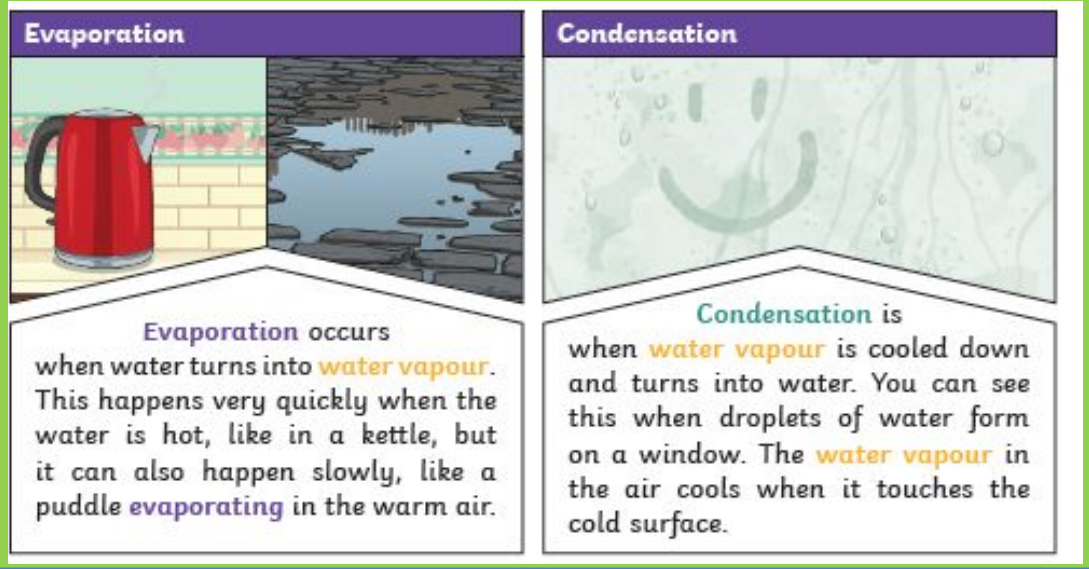
What is evaporation?

What is condensation?



What will I learn?
You will learn how to group materials based on whether they are a solid, liquid or a gas. Explore how materials change states when they are cooled or heated. Study the water cycle and understand evaporation and condensation.

Key words:
Solids, liquids, gases, water vapour, melt, freeze, evaporate, condense, precipitation.



Activity – explore condensation – where do you normally find this? Can you see what happens in this process? Can you

Year 4 – Science – Autumn 2 – Animals including Humans

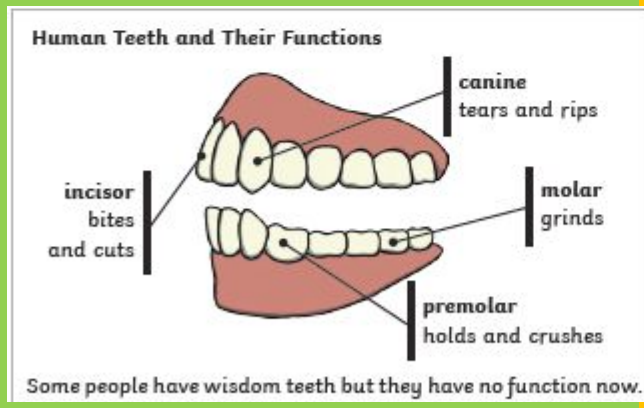
Key Questions:
What does the shape of a tooth tell you about its function?

What happens in the digestive system?

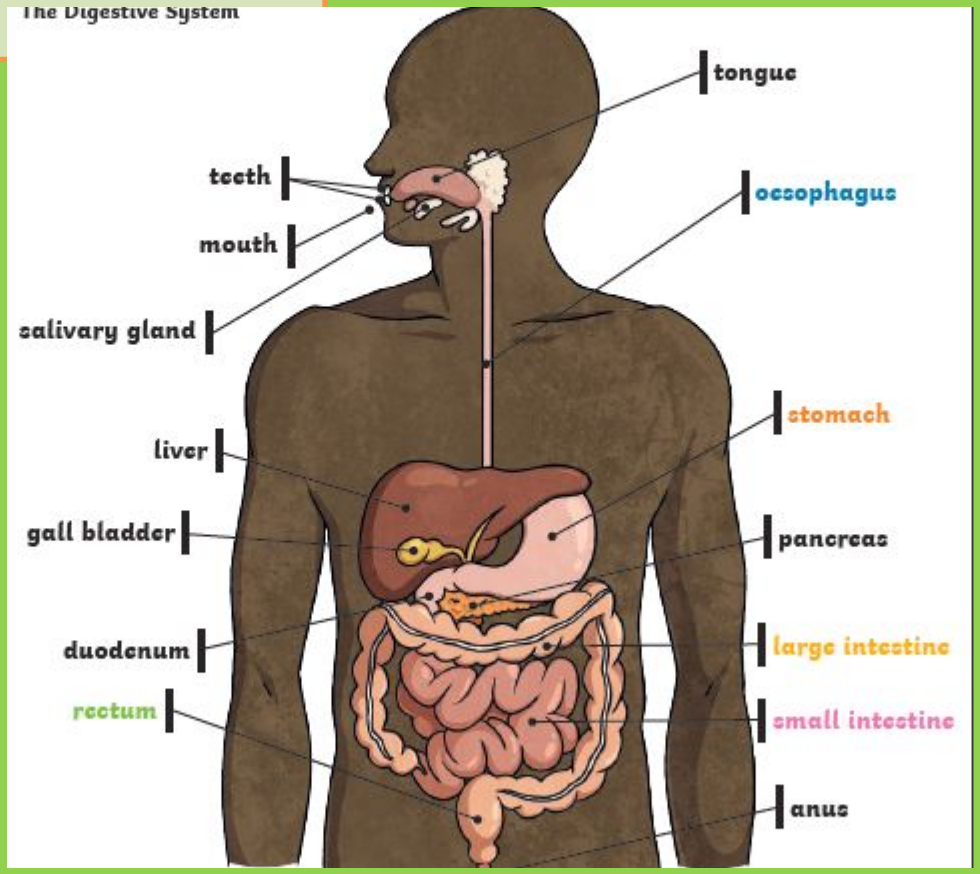
What function do teeth have?

What is the purpose of different types of teeth?

What will I learn?
You will learn about the functions of the digestive system and be able to describe them. You will identify the different types of teeth in humans and explore their functions.



Activity – find out three interesting facts about one of the organs that is part of the digestive system



Key words: digest, oesophagus, stomach, pancreas, intestine, rectum, duodenum, gall bladder, liver, salivary gland,

Year 4 – Science – Spring 1- Sound

Key Questions:
How are sounds made?

Which part of an instrument vibrates to make sound?

How does sound travel to our ears?

What will I learn?
You will learn how sounds are made and associating some with something vibrating.
Know that vibrations from sounds travel to the ear.
Explore patterns in pitch and volume.

HOW IS SOUND MADE?

Vibrations - Sounds are made when something vibrates. By placing rice on a drum, you can see the vibrations when you hit the drum, as well as hearing the sound.

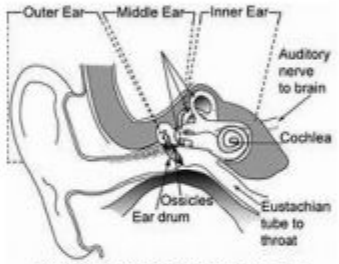


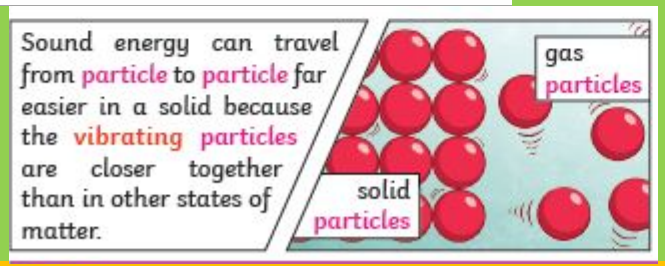
Figure 1: The Outer, Middle, and Inner Ear

HOW DO WE HEAR SOUND?

- **Sound can travel through solids, liquids and gases.**
- Like light, sound travels through the air in waves.
- Sound is made by air molecules vibrating.
- When vibrations are made (e.g. when you clap your hands) the air around the object vibrates. This is the air molecules vibrating.
- The vibrations pass on from air particle to air particle until the ones near your ear vibrate.
- When air molecules inside the ear vibrate, they shake tiny hairs on the insides of the ears. The hairs are connected to nerves under the skin. These nerves send messages to your brain to tell you that you heard a noise.
- Sound travels much slower than light, whether in air or in water. You often hear things after you see them, for example you see the lightning before you hear the thunder.

Activity – have a go at exploring how sounds get fainter as you get further away from the sound source – how could you test this?

Key words: vibrations, pitch, volume, anvil, stirrup, hammer, ear drum, sound proofing, sound wave, vacuum.



Year 4 – Science – Spring 2 - Habitats

Key Questions:
What could we use to identify different organisms?

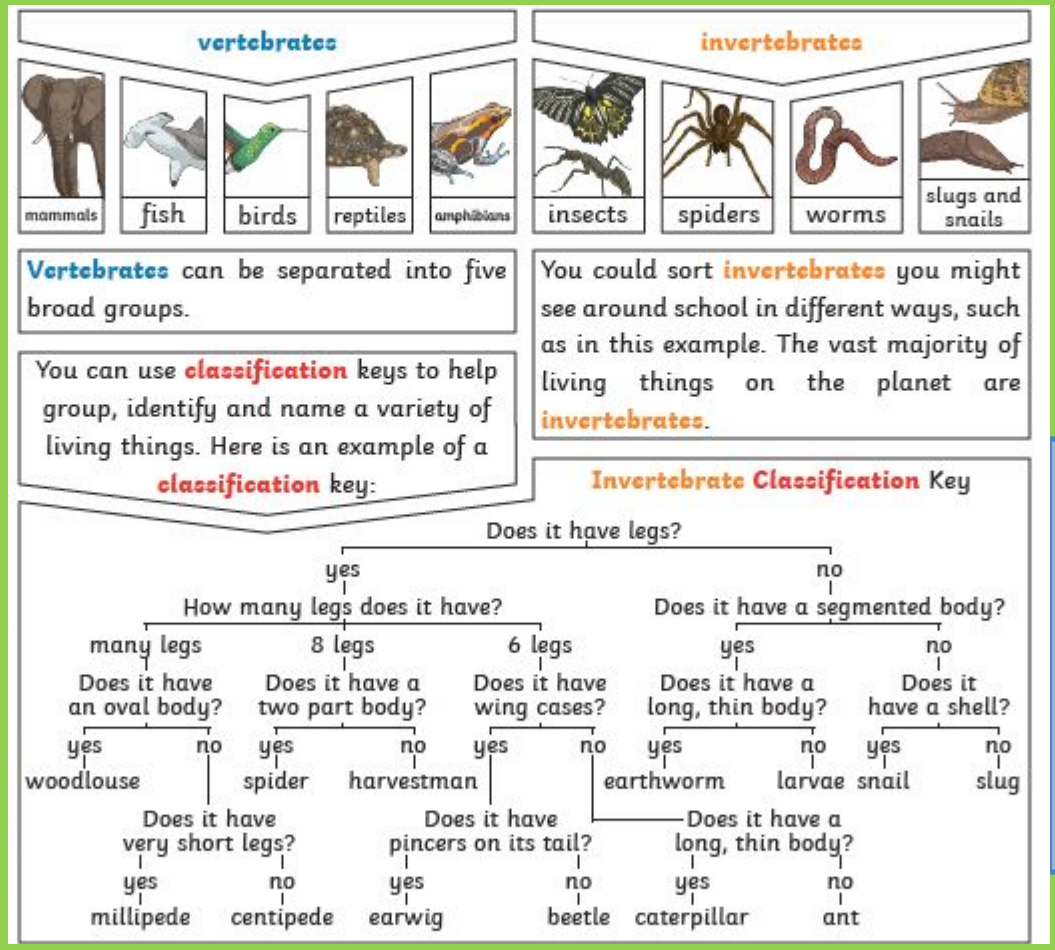
How can you use classification charts?

Why do we need a classification key?

How could you sort invertebrates?

Key words: organisms, life processes, respiration, sensitivity, nutrition, environment, endangered species, extinct.

What will I learn?
Recognise that living things can be grouped in different ways. Explore how classifications can be used to help group, identify and name living things in our local and wider environment. Study how environments can change and this can pose dangers.



Activity – have a look at this classification chart – could you have a go at making your own?

Year 4 – Science – Summer 1 – Electricity

What will I learn?
You will look at appliances which use electricity. You will construct a simple circuit and name its basic parts. Recognise conductors and insulators.

Key Questions:
What does a circuit need to work?

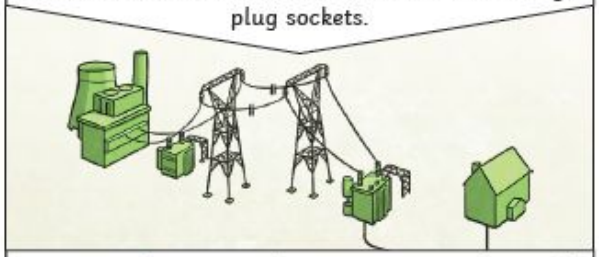
Which type of material conducts electricity?

Name some materials that do not conduct electricity.

What is renewable energy?

There are two types of electric current.

Mains electricity: power stations send an electric charge through wires to transformers and pylons. Then, underground wires carry the electricity into our homes via wires in the walls and out through plug sockets.



Battery electricity: batteries store chemicals which produce an electric current. Eventually, even rechargeable batteries will stop producing an electric current.

Which appliances run on electricity?

Common appliances that use electricity are: toasters, lamps, kettles, laptops, games consoles, phones, torches, TVs, washing machines and irons.

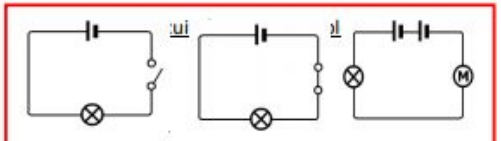
Some appliances use batteries and some use mains electricity.

Batteries can vary greatly in size, shape and power.

What are electrical conductors and insulators?

An electrical conductor lets electricity pass through it. They are often metal (e.g. iron, copper and gold) but also include carbon and water. As our bodies are 18% carbon, electricity is very dangerous to us and because water is a very good conductor of electricity we mustn't use electrical appliances near it!

An insulator doesn't let electricity pass through it, e.g. wood, leather and plastic. Plastic is used to cover electrical wires because it is a good insulator.

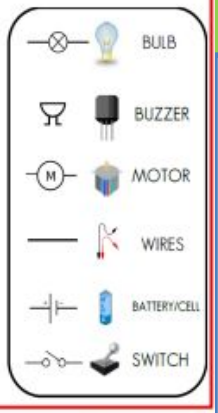


How does a circuit work?

In a series circuit all the components are joined together and the electricity can only flow in one direction - You must learn the different symbols for the different components. Switches can be used to open and close circuits.

However, a circuit will not work properly if:

- the cells aren't connected correctly (+ to - not ++ or - -)
- a component isn't working or there's no bulb;
- the circuit has gaps
- one of the components acts as an insulator.



Focus Scientists — Alessandro Volta

Alessandro Volta (1745-1827) Italian physicist best known for the development of the voltaic pile (battery). SI unit of voltage, the volt is named after him.

Claire J Tomlin

Claire J Tomlin (b.1969) is a highly innovative electrical engineer who has born in Southampton and has worked at both the Universities of Berkeley and Stamford.

Activity – have a look around your house – what different things use electricity to work. What ways can we use renewable energy?

Key words: electricity, renewable, generate, non renewable, appliances, battery, circuit.

Year 4 – Science – Summer 2 – Food Chains

Key Questions:
What is the difference between predators and prey?

How is energy transferred?

What is prey?

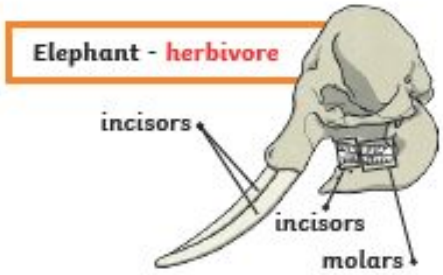
How do you know which animals are the predators?

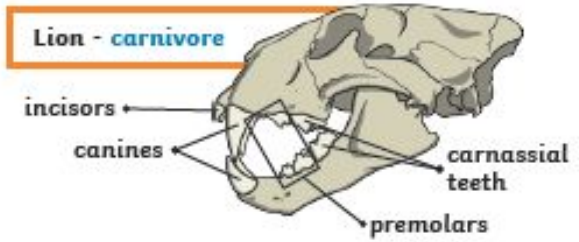
What will I learn?
You will make your own food chains and interpret different food chains. You will be able to identify the producer, predator and prey.

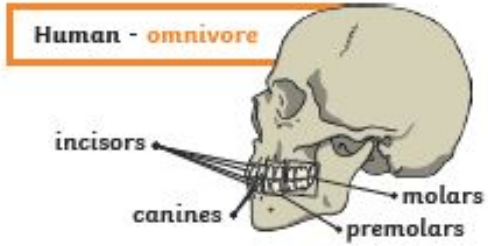
Key words: food chain, producer, consumer, predator, prey, energy.

Activity –
Can you think of a food chain that you know exists? Can you draw it? Can you identify the consumers?

The teeth of an animal are designed to eat different foods depending on the diet of the animal. Examples of a herbivore, a carnivore and an omnivore skull:







An Example of a Food Chain
The arrows in a food chain show the flow of energy.