Mr A, Mr C and Mr D Present

Knowledge Organisers

Year 4 Science

Contents

Living Things and Their habitats

MRS GREN

M.R.S. G.R.E.N. is a useful way to remember the necessary features of living organisms.

MOVEMENT
It can change its position.

RESPIRATION
It releases energy from a food source.

SENSITIVITY
It responds to things (e.g. light).

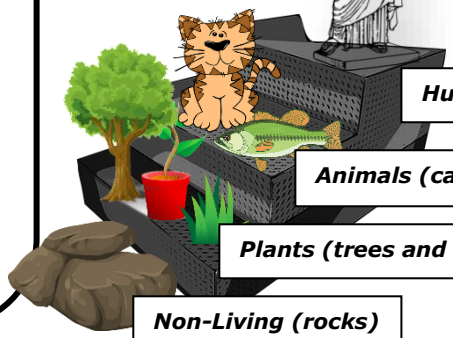
GROWTH
It can develop and get larger.

REPRODUCTION
It can make copies of itself or produce offspring.

EXCRETION
It can get rid of waste products.

NUTRITION
It consumes chemical material / food.

In about 350 B.C. Aristotle (a Greek philosopher) classified all things into 4 main groups.



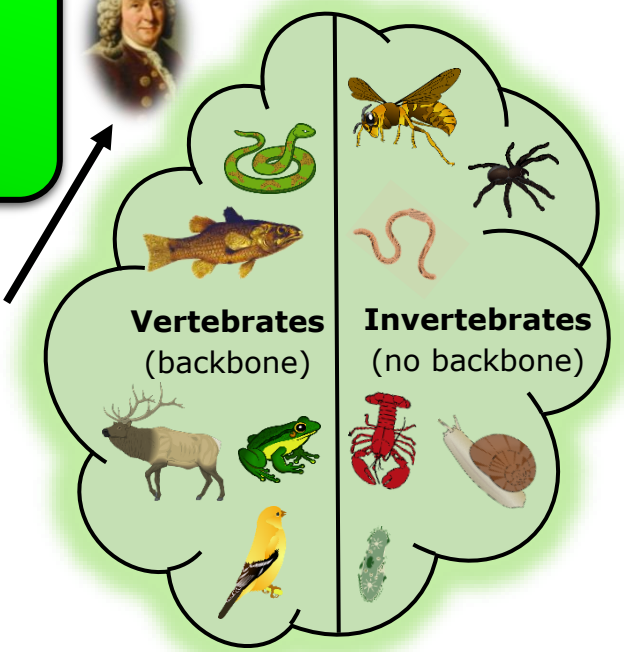
Human Beings

Animals (cats and fish)

Plants (trees and grass)

Non-Living (rocks)

Carl Linnaeus simplified the naming of living things in 1735. Names of living things were often very long so he gave them a two-part (binomial) name. It was a mixture of genus and species (and in Latin) e.g. Human was Homo Sapien, Wolf was Canus Lupus and Lion was Felis Leo.

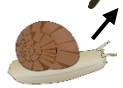


FOOD CHAINS

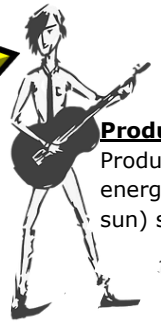
Decomposer
Feeds by decomposing the remains of living things.

Consumer
Eats the producer.
(Secondary consumers eat the primary consumer.)

Producer
Produced from an energy source (e.g. the sun) such as plants.



Predators hunt and eat other animals.
Prey are hunted by predators.



Groups of Living Organisms

Mammals - warm-blooded, have hair on their bodies, parents care for the young, females produce milk for their babies, breathe through lungs, most are terrestrial (live on land) though some are aquatic (live in sea).

Birds - warm-blooded, most can fly, have feathers and wings, most build nests, hatch from eggs, most baby birds must be fed by parents and cared for until they can survive on their own (though some, like baby chickens and quail, can search for food a few hours after hatching)

Fish - aquatic animals, breath through gills, cold-blooded, most have scales, most develop from eggs that the female lays outside her body

Amphibians - live part of their life cycle in water and part on land, have gills when young, later develop lungs, cold-blooded, usually have moist skin.

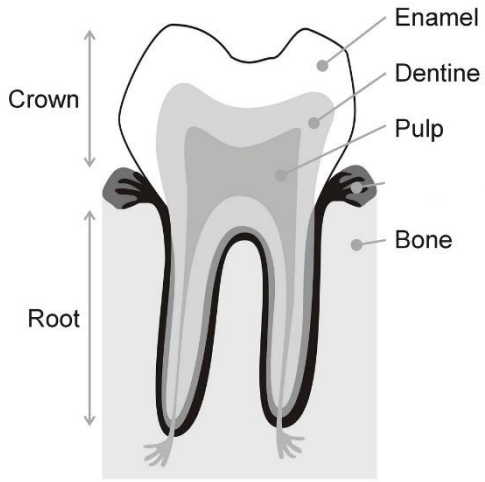
Reptiles - hatch from eggs, cold-blooded, have dry, thick, scaly skin

Man-Made Threats to the Environment

1.) Air pollution – Petrol and diesel used to power motor vehicles release carbon monoxide – a poisonous and harmful chemical. The burning of fossil fuels contribute to environmental damage too.
2.) Water pollution – Industrial waste and run-off from farming, which often uses fertilisers, can pollute rivers and streams.
3.) Rubbish –Plastic and household waste ends up on the streets, in the sea or in rubbish dumps, destroying habitats and wildlife.

The Digestive System and Teeth

Parts of the Tooth



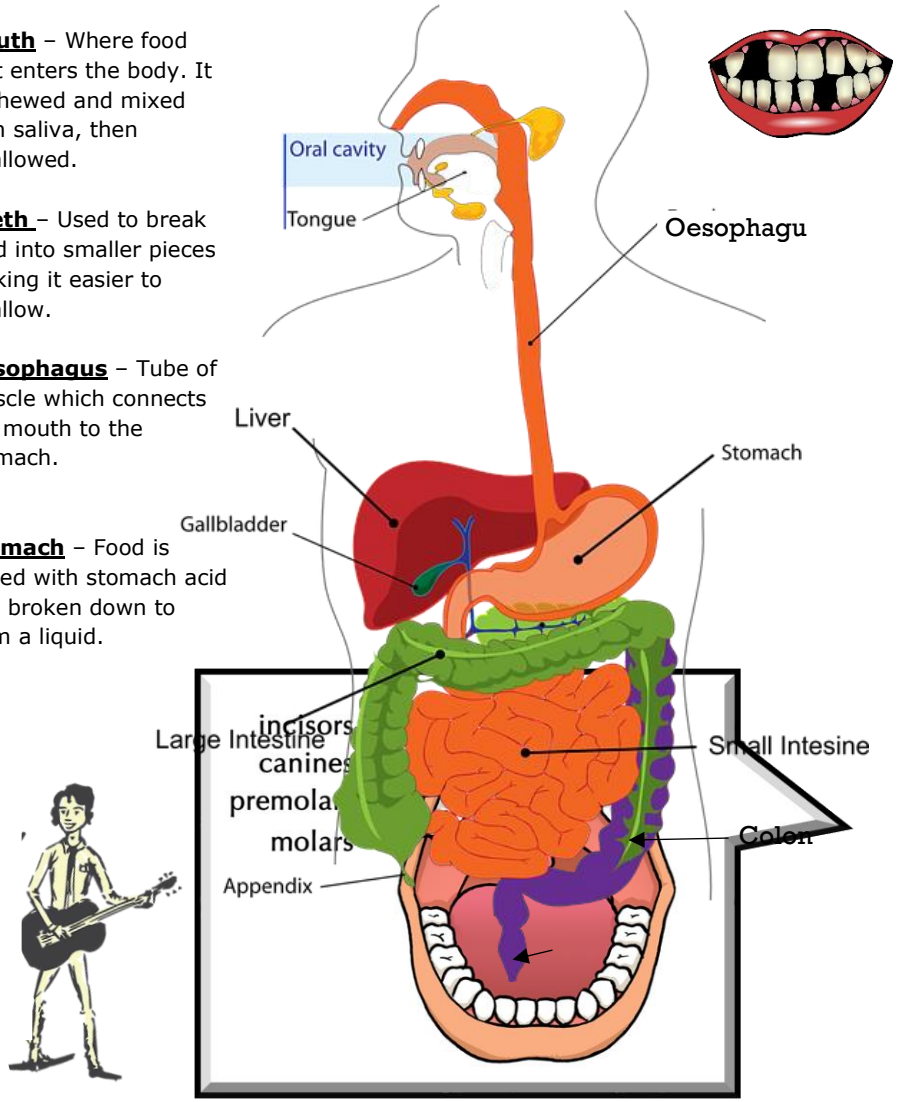
Enamel: The visible part of the tooth. It is harder than bone and protects the tooth.
Dentin: Found underneath the enamel and is similar to bone.
Pulp: Found in the centre of the tooth and is full of blood vessels and nerves. It supplies the tooth with nutrients.

Mouth – Where food first enters the body. It is chewed and mixed with saliva, then swallowed.

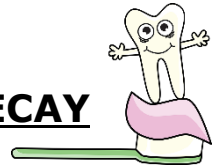
Teeth – Used to break food into smaller pieces making it easier to swallow.

Oesophagus – Tube of muscle which connects the mouth to the stomach.

Stomach – Food is mixed with stomach acid and broken down to form a liquid.



TOOTH DECAY



1.) Tooth decay is the destruction of your tooth enamel

2.) It can be a problem for children, teens and adults.

3.) Plaque, a sticky film of bacteria, constantly forms on your teeth.

4.) When you eat or drink foods containing sugars, the bacteria in plaque produce acids that attack tooth enamel.

5.) Tooth ache and bad breath are symptoms of tooth decay.

Rectum -
we do not
stored he
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body.

Materials

CHANGING STATE

Solids, liquids and gases are called the three states of matter. Materials can be changed from one state to another by heating or cooling.

Heating

If ice (solid) is heated, it changes to water (liquid). This change is called **melting**.

Water (liquid) can change to water vapour (gas). This is called **evaporation**.

If water (liquid) is heated until it **boils**, it changes to water vapour (gas) very quickly. Water boils at 100°C.

Cooling

If water vapour (gas) is cooled, it changes to water (liquid). This change is called **condensing**.

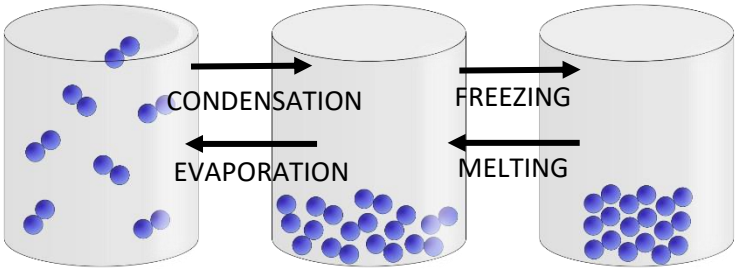
If water (liquid) is cooled, it changes to ice (solid). This change is called **freezing**. Water freezes at 0°C.

FEATURES

- Solids hold their shape. (Salt, sand and sugar are tiny solids so they pour like a liquid but they pile up and are nit wet.)
- Liquids form a pool not a pile!
- Gases escape from an unsealed container and fill the entire volume of space.

Three states of matter

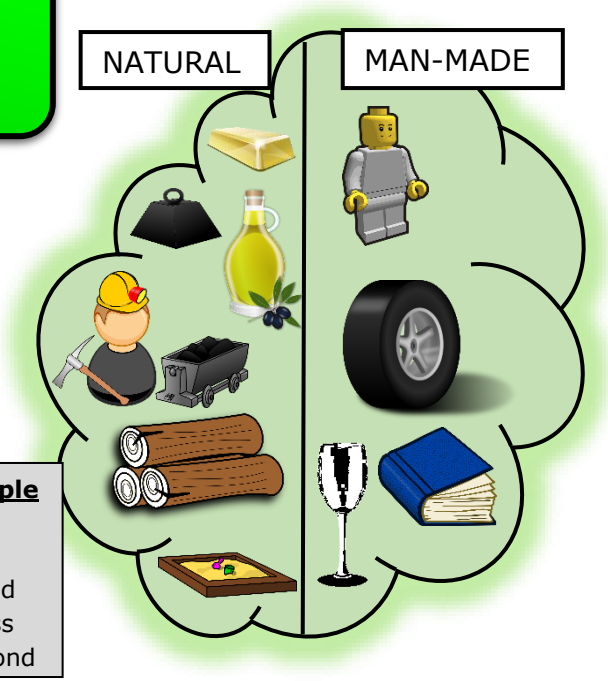
GAS: particles far apart and randomly arranged / move around
LIQUID: particles close but randomly arranged / move around
SOLID: particles very close together / vibrate around a fixed position



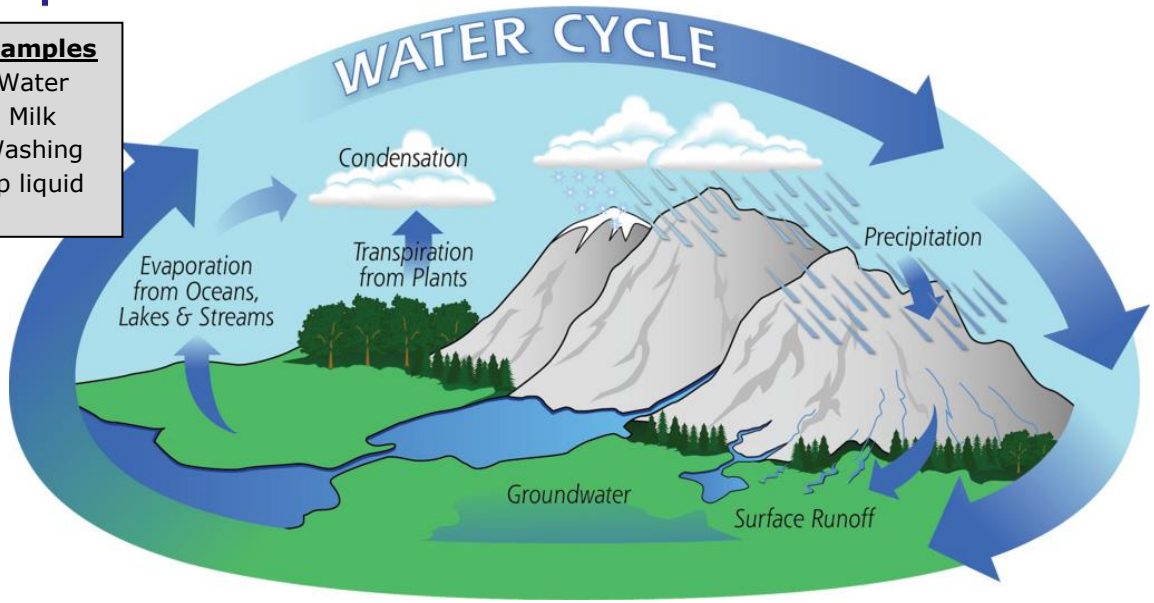
Gas Liquid Solid

Examples
Steam (water vapour)
Hydrogen
Carbon Dioxide
Oxygen

Examples
Water
Milk
Washing up liquid



Examples
Ice
Wood
Glass
Diamond



Sound

VIBRATIONS

Sound is made when an object vibrates and therefore causes the air around it to vibrate too. These vibrations are carried to your ear for you to hear them.

Sound vibrations can travel through different materials:

SOLIDS: metals, stone, wood
LIQUIDS: water
GASES: air

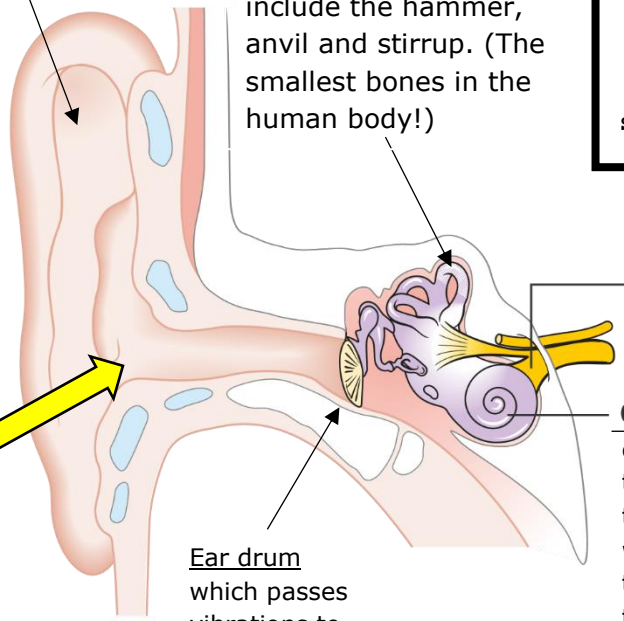
Sound travels better through some materials than others. It travels very well through metal pipes for example.

The louder the volume, the bigger the vibrations. The size of the vibration is called the ***amplitude***. Quieter volumes have smaller amplitudes and louder sounds have larger amplitudes.

Sounds travel in a ***wave***. The vibrations make ***air particles*** closes to the object vibrate, which then passes the vibrations to the particle next to it and so on – like dominoes falling!

Outer Ear

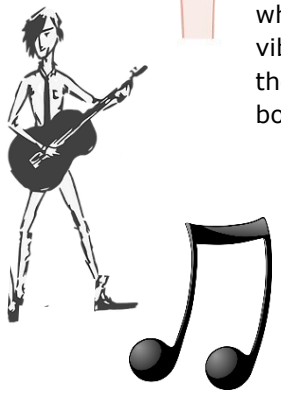
Middle ear bones which include the hammer, anvil and stirrup. (The smallest bones in the human body!)



Nerve
sends electrical signals to the brain.

Cochlea
contains thousands of tiny hair cells which change the vibrations to electrical signals.

Ear drum
which passes vibrations to the middle ear bones.



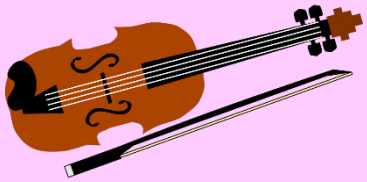
DID YOU KNOW?
Sounds get fainter (quieter) as the distance from the sound source increases.

DID YOU KNOW?
Soundproofing is when a material is used to absorb loud sounds. Recording studios or night clubs might use them to stop sound escaping the room! Soft, spongey or pliable material is often best for this.

PITCH

The pitch of a sound is how high or how low it sounds. A high pitch has a high sound and a low pitch has a low sound.

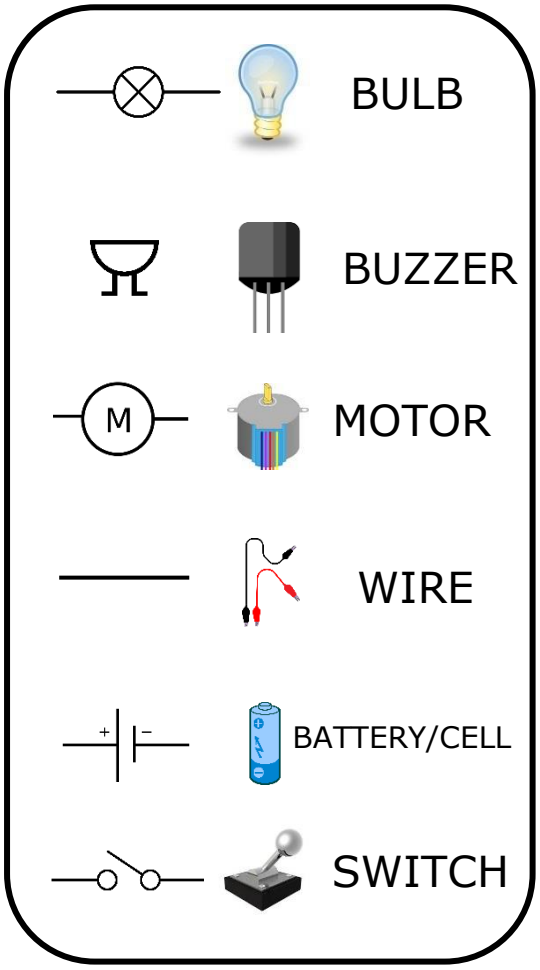
Stringed Instruments
Tighter, thinner or shorter strings make higher pitches. Faster vibrations make pitches high and slower vibrations make pitches low.

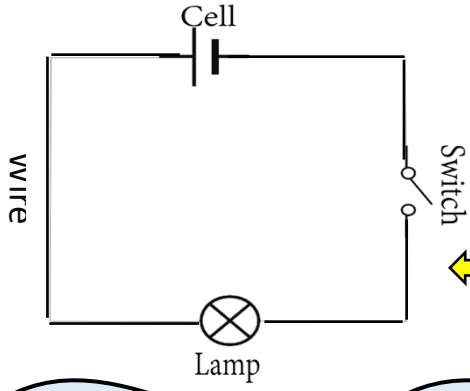


Wind Instruments
The column of air inside the instrument causes it to vibrate. Shortening this makes a higher sound, lengthening it makes a lower sound.

Percussion Instruments
The surface is struck and it therefore vibrates. Smaller instruments have higher sounds (smaller keys of a xylophone, hand bells etc.). The tighter or thinner the skin on a drum, the higher the pitch.

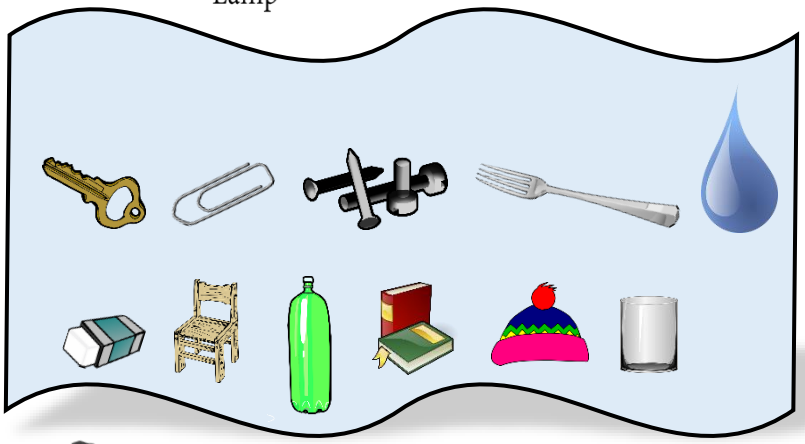
Electricity





This circuit will not work because the switch is open.
A circuit must be complete to work. It must also always have a battery/cell.

COMMON APPLIANCES



DANGER! HIGH VOLTAGE!
Electricity is everywhere so always be safe. Be careful of mains switches, open sockets and any signs to do with electricity. The human body is 80% water so it conducts electricity. If someone has had a shock always turn the electricity off first, then call for help!

1.) If you make the wires longer, the bulb will get dimmer. This is because there is more resistance.
2.) If you add more bulbs, the bulbs get dimmer. This is because there is also more resistance.
3.) If you add more batteries, the bulbs will get brighter. This is because there is less resistance and a greater current.