

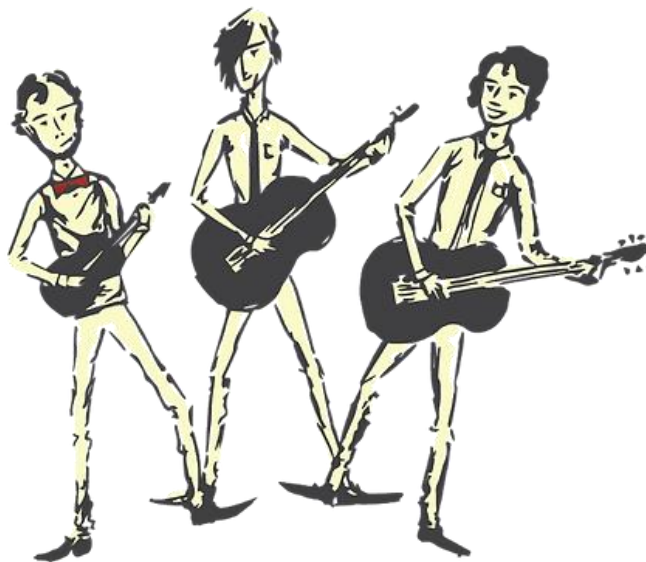
Mr A, Mr C and Mr D  
Present

# **Knowledge Organisers Year 6 Science**



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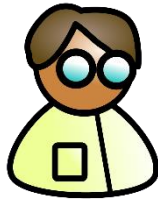
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## The 7 Levels of Classification

Today we use 7 different levels of classification. These are as follows:

Kingdom (Keeping)  
Phylum (Precious)  
Class (Creatures)  
Order (Organised)  
Family (For)  
Genus (Grumpy)  
Species (scientists)



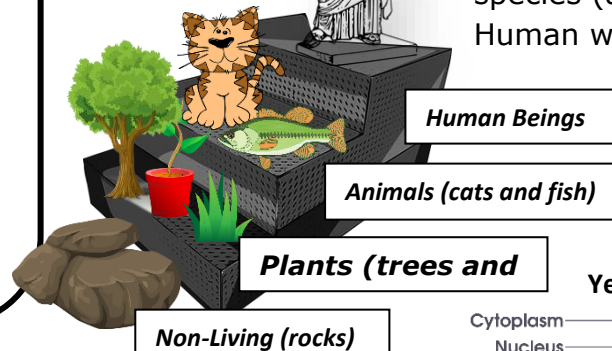
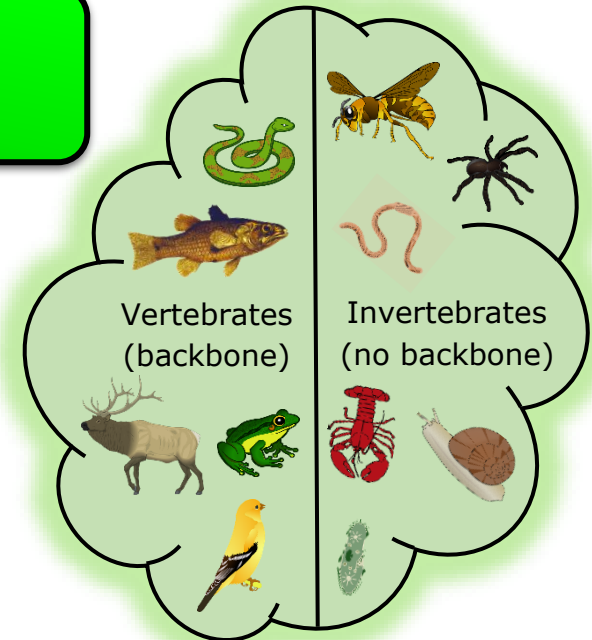
Here is an example of how humans are classified. You will see that our species is homo sapiens.

# Classification

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



Carl Linnaeus then 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,



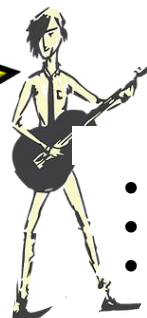
## Kingdoms

Scientists have now divided living things into five larger groups called Kingdoms.



- 1.) Plants
- 2.) Animals
- 3.) Fungus (mushrooms, yeast, mould, mildew)
- 4.) Protist (protozoans, amoeba, euglena)
- 5.) Prokaryote (blue-green algae, bacteria)

- 1.) In complex organisms, groups of cells form tissues (for example: in animals, skin tissue or muscle tissue; in plants, the skin of an onion or the bark of a tree).
- 2.) Tissues with similar functions form organs (for example: in some animals, the heart, stomach, or brain; in some plants, the root or flower).
- 3.) In complex organisms, organs work together in a system (the digestive, circulatory, and respiratory systems).

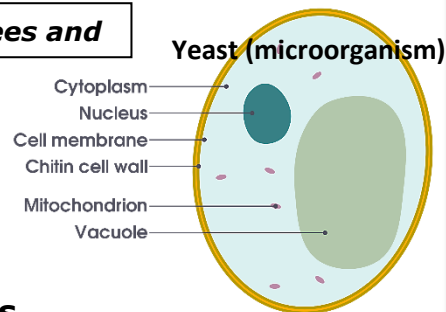


## 3 Types

- Viruses
- Bacteria
- Fungus

## Microorganisms

If you can only see a living thing with a microscope, it means it is a microorganism. These are found everywhere. Some of them, like yeast are helpful whilst some of them are harmful and disease causing, like bacteria. It is important to know how to avoid spreading the bad ones. (Wash your hands!)





Red blood cells are pushed around your body by your heart, which acts like a pump, beating about 100,000 times a day!



As the blood cells reach your heart, they pass through valves, which are like doors and only open one way, keeping blood pumping in the same direction.



Blood is pumped to the lungs to pick up oxygen (O<sub>2</sub>) which has been inhaled (breathing in). It then goes back to the heart to get pumped to every other part of the body

As it drops off oxygen around the body, it picks up carbon dioxide (CO<sub>2</sub>) to take back to the lungs for the lungs to exhale (breathing out).

### Blood Vessels

**1.) Arteries** – Take blood **AWAY** from the heart to the body organs and tissues. When blood is pumped through these, you can feel your pulse.

**2.) Veins** – Take blood **TOWARDS** the heart from body organs and tissues,

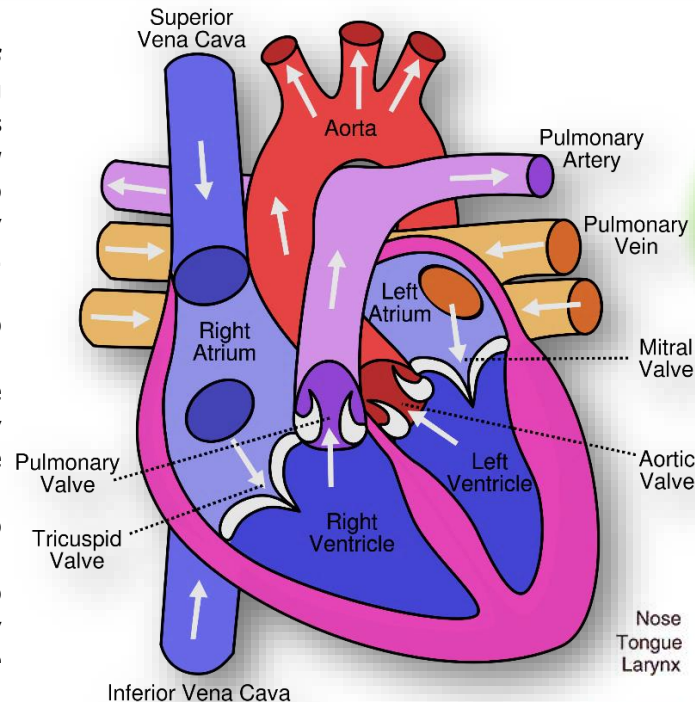
**3.) Capillaries** – Tiny blood vessels which take the blood into organs and tissues.

# The Circulatory and Respiratory System

## Nutrients

(made from eating carbohydrates, fats and proteins) allow your body to perform daily activities.

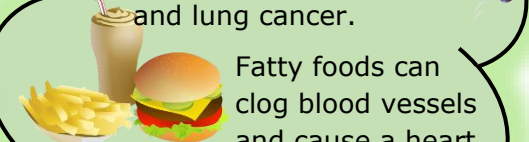
Enzymes help break food down in the digestive system and they become useable nutrients, which are absorbed into your bloodstream and passed to parts of your body through the



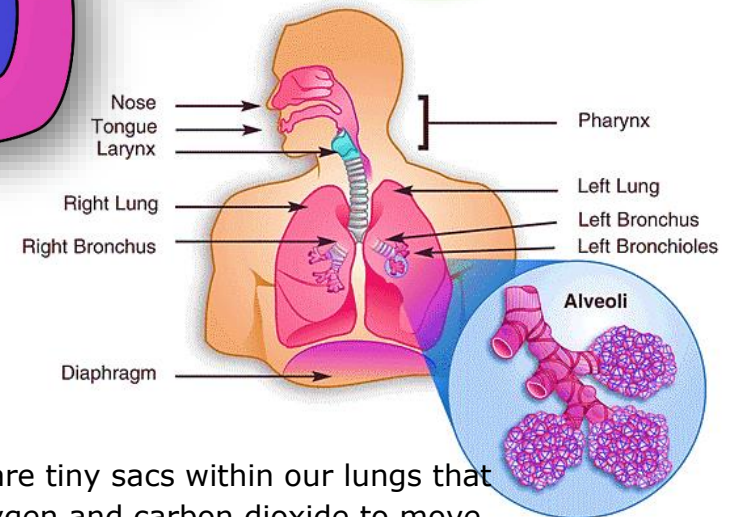
## STAYING HEALTHY



Cigarettes contain huge amounts of chemicals which can cause lung damage and lung cancer.



Fatty foods can clog blood vessels and cause a heart attack.



If someone loses a lot of blood, they can have a transfusion when blood from others can be pumped in. There are 4 main blood groups: A, B, AB and O.

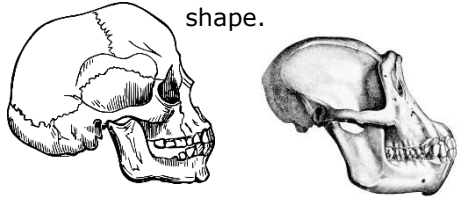
**Alveoli** are tiny sacs within our lungs that allow oxygen and carbon dioxide to move between the lungs and the bloodstream.



## FOSSILS



Fossils are the remains of living things which inhabited the world millions of years ago. They are formed in sedimentary rock (sand, mud and pebbles squashed under layer, after layer over time) and plants/animals get trapped in these layers, revealing their shape.



HUMAN SKULL CHIMPANZE SKULL

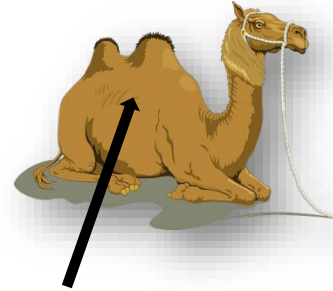
When palaeontologists compare fossils to animals from today, they can see similarities and identify relationships between them. Since evolution of a species happens over such long periods of time, evidence is usually taken from fossils.

- 1.) Charles Darwin is an English scientist best known for his theory of evolution.
- 2.) He was a geologist who went travelling in 1831 on the HMS Beagle.
- 3.) He saw many animals and plants and came up with the idea of natural selection (the strongest survive and evolve).
- 4.) His book 'Origin of the Species' was released in 1851 and was controversial because it went against the creation story in the Bible.

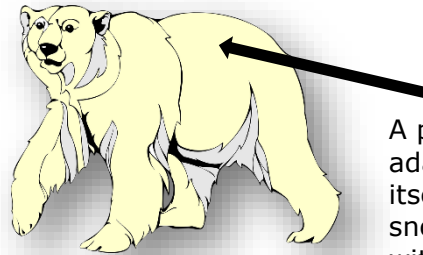
# Evolution

**Question:** What is adaptation?

**Answer:** A change in a plant or animal's body to suit its location which can evolve over thousands of years in the most efficient way. If they don't adapt, then they may not survive.

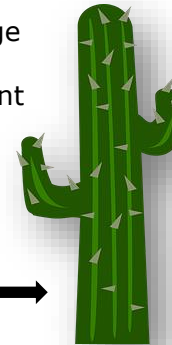


A camel has humps of fat storage to use up for energy in the dry desert when there is a shortage of food.

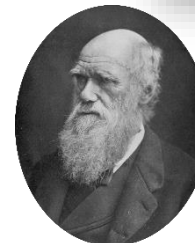


A polar bear has adapted to camouflage itself against white snow/ice so it can hunt without being seen.

A cactus stores water to help keep it alive in the desert. It also has spikes to protect itself from attack.



**Charles Darwin**  
(1809 – 1882)



## THE DODO



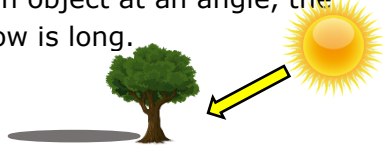
The dodo was a flightless bird from Mauritius which failed to adapt to its new environment. Humans arrived, hunted it and introduced other animals and so became extinct in 1681.

**Evolution** means change over time. It is the reason we have so many species on earth. It happens when there is competition to survive (natural selection) and through differences within a species caused by inheritance and mutations.

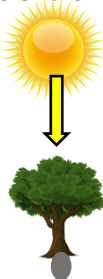
**Inheritance** is when something is passed on to the next generation. Offspring are not identical to their parents and some characteristics are inherited (carried in offspring from parents) and other differences are new in the offspring – these are called mutations

# Light

As the earth spins, it makes the sun appear to rise in the east in the morning. Because the sun hits an object at an angle, the shadow is long.



As the earth continues to spin the sun is overhead by midday. Because the sun hits the object from above, the shadow is short.



As the earth spins and the sun sets in the west in the evening, the shadow is long.

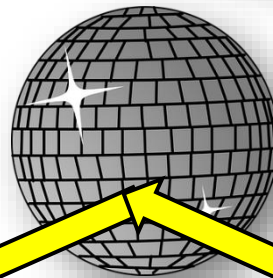
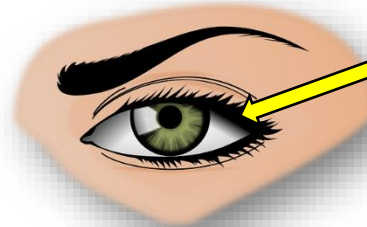


- 1.) We can see objects because light reflects off them and into our eyes.
- 2.) Light reflects off most objects, especially colours like white and yellow.
- 3.) If there is no light at all (pitch-black), then there is no light to reflect and we can't see anything at all.
- 4.) At night you can still see a bit in the dark because the moon is reflecting light.

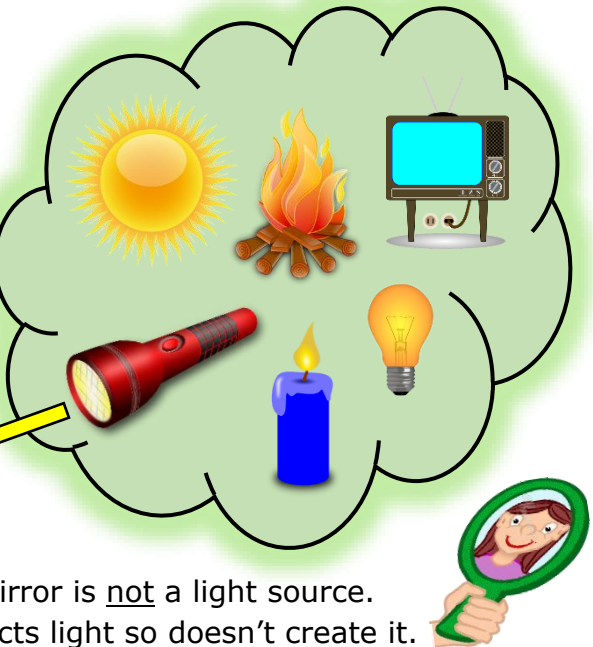


Because light travels in straight lines, when it hits an object, it is blocked. It can't bend around the object so it casts a shadow.

Light travels in straight lines. It travels from the light source either directly into our eyes, or reflecting off objects at 670 million mph.



When light hits a smooth object, it bounces off (reflects) making it appear shiny.



A mirror is not a light source. It reflects light so doesn't create it.

**Opaque:** This is the name given to objects which light *cannot* travel through. They block light and create shadows

**Translucent:** This is the name given to objects which *some light can* travel through.

**Transparent:** This is the name given to objects which light *can* travel through.

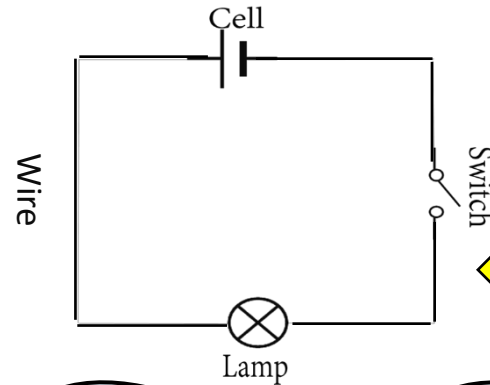
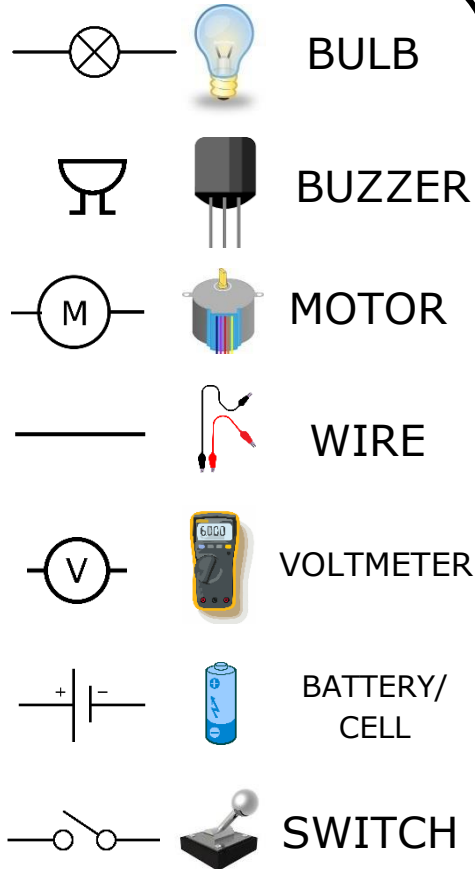
Rainbows are formed when the sun shines through water particles (transparent) and when white light passes through, it 'bends' and splits into the range of colours which make white light

ROY G. BIV





# 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



**Current:** this is the amount of electricity flowing through the circuit (a flow of electrons moving in a loop in the circuit). It is measured in amps.

**Voltage:** is the difference in electrical energy between two parts of a circuit. It is measured in volts. The bigger the voltage, the bigger the current.

An electrical conductor lets electricity pass through. They are often metals but it also includes water.



An electrical insulator does not let electricity pass through.



- 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.



## 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!

