

Science Knowledge Organiser- Year 6 Evolution and Inheritance

Adaptation

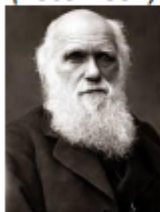
Plants and animals have characteristics that make them suited to their environment. E.g. camel:



What is adaption?	Adaption is when things evolve to overcome challenges in their environment. For example by adapting their behaviour.
Examples of adaption	Migration - Birds have adapted to move around the world to find weather and food sources to suit them. - Birds that didn't do this may have run out of food and died.
	Sticking together in packs Animals that learned to live in packs were more likely to be safer and more successful when hunting, leading them to be more likely to survive.

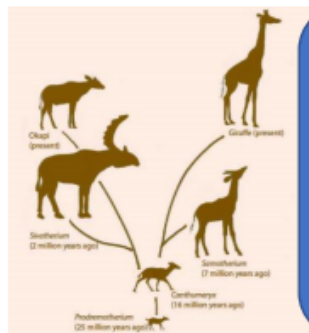
Significant scientists

Charles Darwin
(1809-1882)



Charles Robert Darwin was born in Shrewsbury and was an English naturalist and biologist. His scientific theory of evolution by natural selection became the foundation of modern evolutionary studies.

Adaptation can lead to evolution if the environment changes. Animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. This is natural selection. Over time these inherited characteristics become more dominant within the population.



Giraffes have evolved to have a longer neck through natural selection. This means they can reach food on the higher branches of trees.



Fossils give us evidence of what lived on the Earth millions of years ago.

By studying fossils, scientists can put together how a plant or animal looked. They can identify what the animal ate, where it lived and how it died.

Living things produce offspring of the same kind. The offspring are not normally identical to their parents and vary from each other.

What is evolution?	Evolution is the way that living things change over time.
Do things evolve?	- We know that living things used to look a lot different to how they do now. We know this because fossils have been found that show creatures that look a lot different to how they do today. - Fossils show us that living things have changed over time.



Science Knowledge Organiser- Year 6 Light

Significant scientists

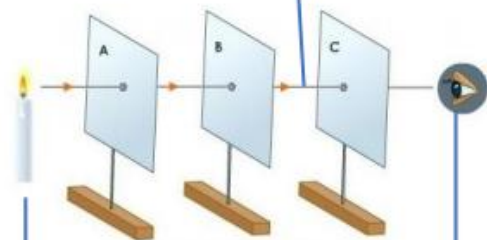
**Abu Ali al-Hasan
(Alhazen)
(965-1040)**



Alhazan was an Iranian mathematician, astronomer and physicist. He was the pioneer of modern optics. He carried out experiments with pinhole cameras and candles and explained how the image is formed by rays of light travelling in straight lines.

Light travels in a straight line:

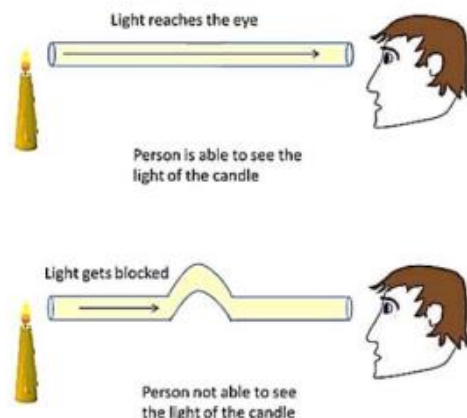
We can use an arrow to represent the path of the light.



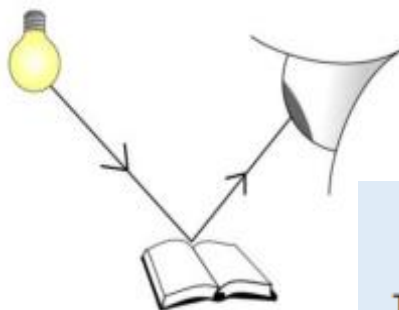
Light source

We see light from the light source when it enters our eyes.

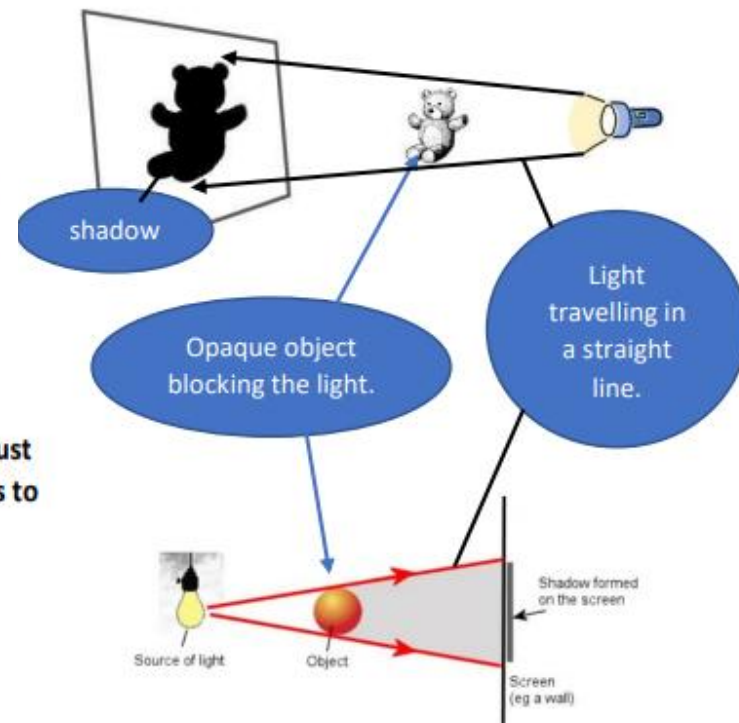
Light may come directly from a light source.



For objects that are not a light source, light must be reflected from the object into our eye for us to see the object:



Shadows have the same shape as the objects that cast them:



Things you need to know about light

- Light travels in straight lines
- Light travels extremely fast - 186,282 miles per second (that's like travelling around the world over 7 times in a second)
- If something gets in the way of light, a shadow is formed.

Science Knowledge Organiser- Year 6 Electricity

Significant scientists

Nicholas Tesla
(1856-1943)



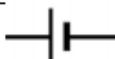
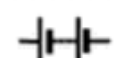
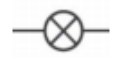
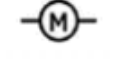
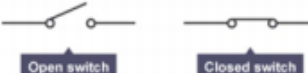
Nicholas Tesla was a Serbian-American engineer and physicist. He invented the first alternating current (AC) motor and developed AC generation and transmission technology. He worked for Thomas Edison when he first moved to New York.

Peter Rawlinson

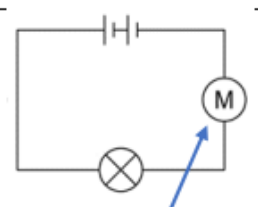
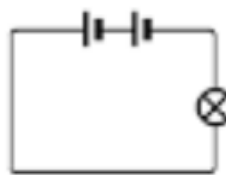
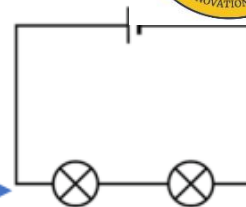


Peter Rawlinson is a British engineer based in California. He is working on the development of electric vehicles, providing clear vision for a next-generation product.

Circuit symbols

cell	
battery	
wire	
bulb	
buzzer	
motor	
switch	

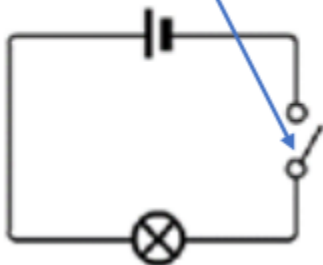
Adding more bulbs to a circuit will make each bulb less bright.



If we add a motor into a circuit with a single bulb, the bulb will be less bright.

If we then add more motors to the circuit, each motor will spin more slowly.

Switch turned off (open).

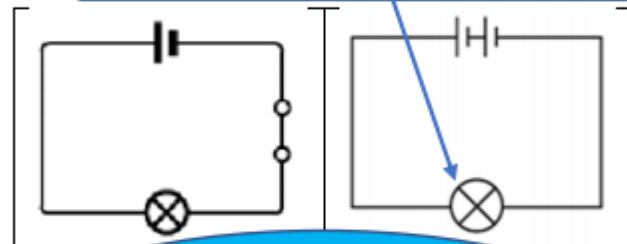


This breaks the circuit so it is not complete and electricity cannot flow. The bulb will turn off.

Circuit	A complete path that an electric current can flow around. It flows from the battery, through wires and devices before returning to the battery. If the circuit is not complete the electric current cannot flow.
Voltage	Volts are a measure of the energy of a flow of electricity.
Mains electricity	Carries a voltage of 210-240 volts. A typical cell in school has 1.5 volts.

Adding more cells to a circuit makes a bulb brighter:

The bulb in this circuit will be brighter.



If you use a battery with a higher voltage, the bulb would also be brighter.

Science Knowledge Organiser- Year 6 Animal including humans

Significant scientist

William Harvey
(1578-1657)



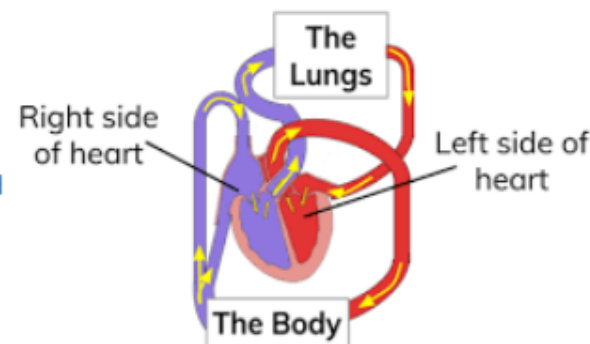
William Harvey was an English physician and the first person to correctly describe blood's circulation in the body. He showed that arteries and veins form a complete circuit.

Healthy bodies

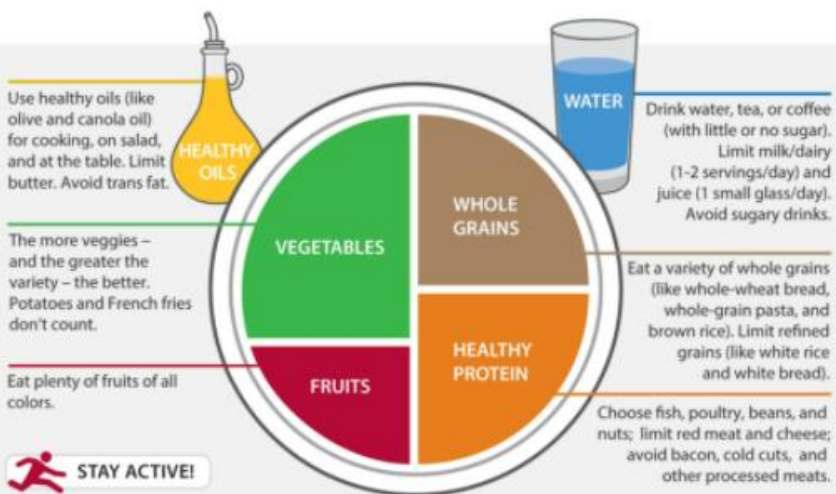
Diet, exercise, drugs and other lifestyle choices have an impact on how our bodies function. This can affect how well our heart and lungs work and how fit and well we feel.

Some choices such as smoking, drinking alcohol and obesity can be harmful to our health:

The human circulatory system



- The **heart** pumps **blood** in the **blood vessels** to the lungs where oxygen goes into the **blood** and carbon dioxide is removed.
- The **blood** goes back to the **heart**.
- It is then pumped around the body so that water, nutrients and oxygen are transported in the **blood** to the muscles and all the other parts of the body where they are needed. As all these are used, they produce carbon dioxide and other waste products.
- Carbon dioxide is carried by the **blood** in **blood vessels** back to the **heart**.
- The cycle starts again as the carbon dioxide is then transported back to the lungs to be removed from the body.



Smoking

Can cause shortness of breath, heart and lung disease.

Alcohol

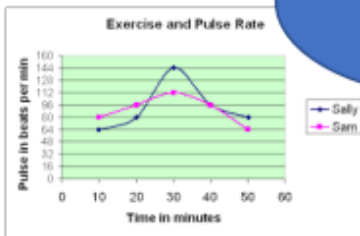
Too much alcohol can damage the liver, heart and stomach.

Our pulse rate increases when we do exercise.

Why is exercise so important?

Exercise can increase fitness, make you feel physically and mentally healthier, strengthen your heart and improve your lung function.

The circulatory system transports nutrients and water in the blood to all the parts of the body that need them. These nutrients provide us with energy.



Science Knowledge Organiser- Year 6 Living Things and Their Habitats

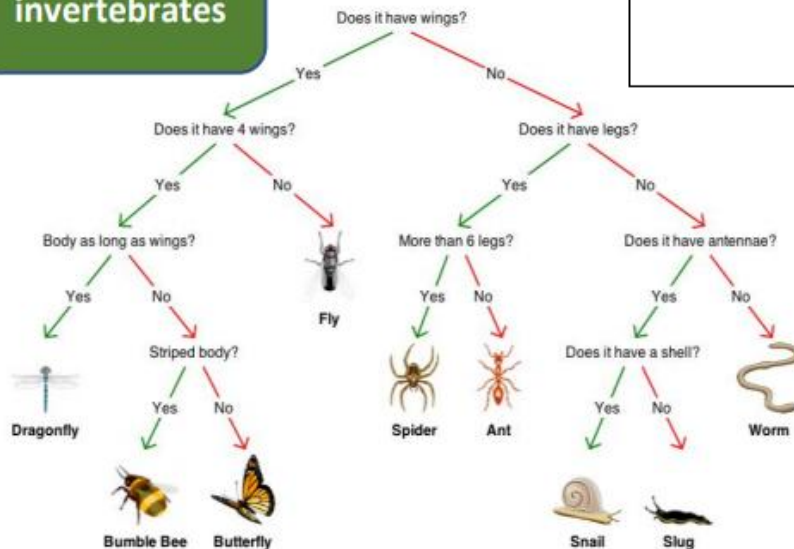
Classification

Living things can be classified into broad groups according to observable characteristics that are similar or different.

Micro-organisms

These are tiny living creatures. Most can only be seen through a microscope. They can be sub-divided into smaller groups including **bacteria**, **fungi** and **viruses**.

Classifying invertebrates



Significant scientists

Carl Linnaeus
(1707-1778)



Carl Linnaeus was a Swedish scientist who developed the modern system of classifying and naming organisms. Before this the names of living things were often very long. He gave them a two-part name.

Animal classes

An animal class is made up of animals that are all alike in important ways. Scientists have grouped animals into classes to make it easier to study them. There are many different animal classes and every animal in the world belongs to one of them.

The Five Kingdoms of Life



Key vocabulary

vertebrate	Animals that have a backbone. They can be divided into 5 groups: fish, amphibians, reptiles, birds and mammals.
fish	- cold-blooded - scales covering its body - has fins - lives in water, lays eggs in water - breathes through gills
amphibian	- cold-blooded - start as eggs in water and breathe through gills - later develop lungs and live on land and in water - lays eggs in water - damp skin/body
reptile	- cold-blooded - breathes with lungs - dry, scaly skin - lay soft-shelled eggs on land
bird	- warm-blooded - breathes with lungs - lays eggs with hard shells - covered with feathers - have wings but not all can fly
mammal	- warm-blooded - have fur or hairy skin - give birth to live young - feed their young milk
invertebrate	Animals that do not have a backbone. Can be divided into several groups including insects, spiders, snails and worms.
plants	Can make their own food. They can be divided broadly into two main groups: flowering plants and non-flowering plants.