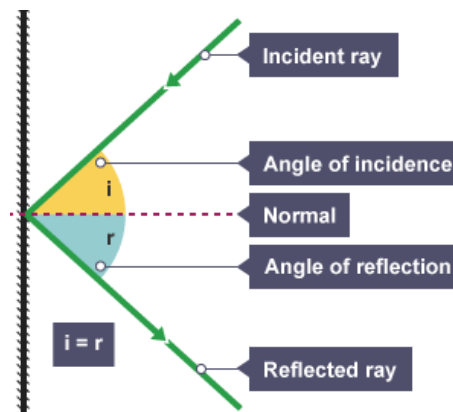
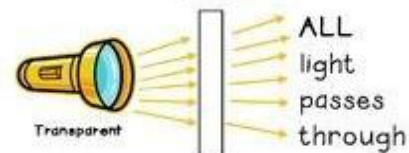


Knowledge Organiser Year 6 Science: Light and Shadows

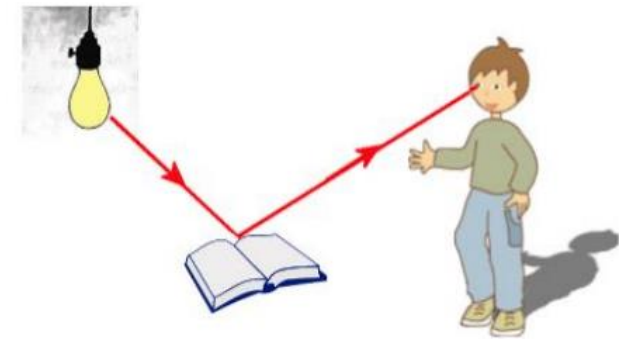
Concept: Energy

Key Vocabulary	Things we already know
light	a form of energy that travels in waves from a source
shadow	a dark shape formed when light from a source is blocked by an opaque object
light source	an object that produces its own light; these can be natural or artificial
natural source	produced from nature, e.g. the Sun,
artificial source	man-made sources of light, e.g. electricity
periscope	apparatus consisting of a tube attached to a set of mirrors that people use to look at things from a hidden position (e.g. in a submarine)
prism	a solid 3D shape where two faces are the same shape and size (and look like a 2-D shape)
reflection	when a light hits a surface and 'bounces' off
refraction	when light passes through a different object and its direction changes
spectrum	a range of colours caused when white light is refracted., e.g. a rainbow
rainbow	an arch of colour caused by the refraction of light on water droplets in the air, usually rain
dispersed	spread out

Translucent, transparent and opaque objects



Refraction of light



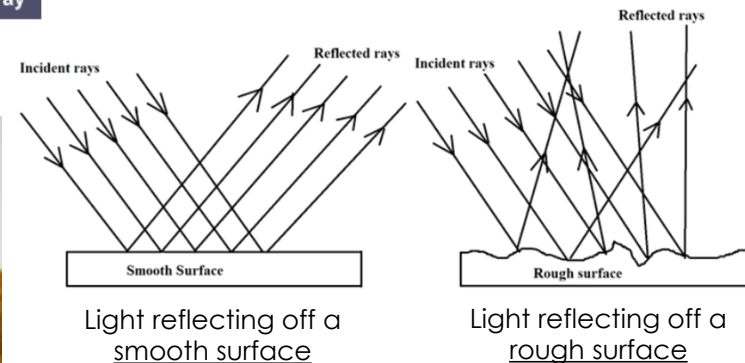
We need **light** in order to see things. Light waves travel from **sources** of light in straight lines. They reflect off objects and into our eyes.

Sources of light: **Natural** vs. **Artificial**

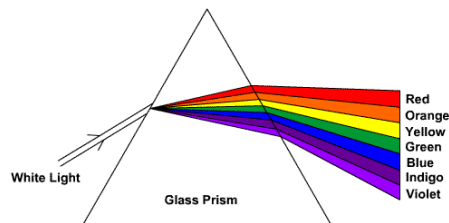


< **The law of reflection**

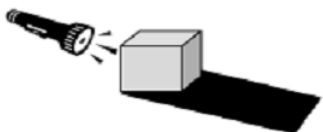
This law states that a light's angle of incidence is ALWAYS equal to the angle of reflection when being reflected on a smooth surface.



When white light passes through a glass **prism**, it is **refracted**. The light changes direction and is then **dispersed** as it exits the prism.



As the **light source** moves higher, the shadow gets shorter.
As the light source moves lower, the shadow gets longer.



Knowledge Organiser Year 6 Science: Electricity

Concept: Energy



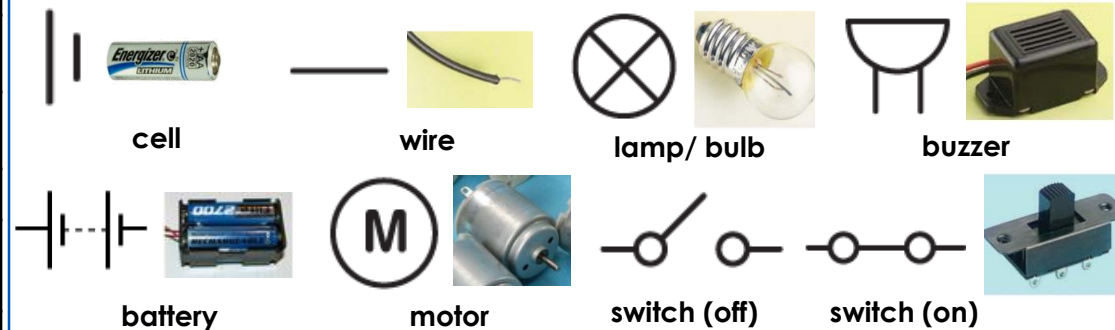
- Electricity is a form of **energy**.
- Electricity can flow through wires/ cables and be stored in **batteries** (or cells).
- Some materials **conduct** electricity (conductors) and some do not (insulators).

How do we make **electricity**?



Key Vocabulary	Things we already know
electricity	a form of energy resulting from the existence of charged particles
energy	how things change and move
conductors	materials which allow electricity to flow through them easily; <i>for example, metals</i>
insulators	materials which do not allow electricity to travel through it easily; <i>for example, plastics</i>
current	a flow of electricity which results from the ordered directional movement of electrically charged particles
amps	measure the number of electrons (current) that can flow through a material ; e.g. a wire in a circuit
voltage	an electrical force that makes electricity move through a wire, measured in volts
circuit	a complete and closed path around which a circulating current can flow
component	a part of a circuit; e.g. bulb, buzzer
cell	a device containing electrodes that is used for generating current
battery	a container consisting of one or more cells where chemical energy is converted into electricity and used as a source of power

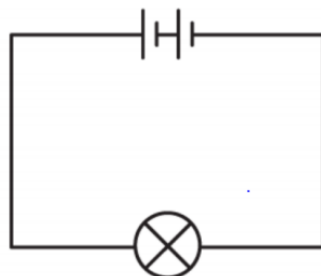
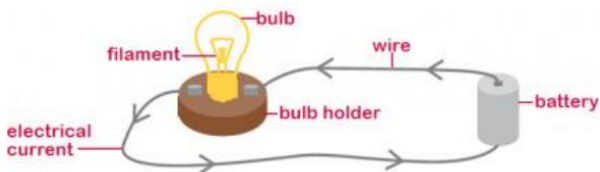
Main components of a **circuit**



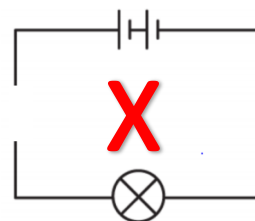
A complete, simple **circuit**

In order for electricity to flow, a circuit needs three things:

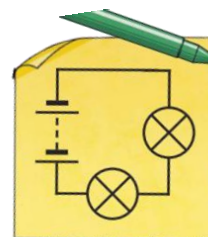
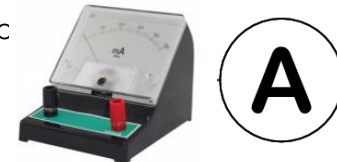
1. A source of electricity (cells/ battery)
2. No gaps in the circuit (closed)
3. Conductors (metal wires)



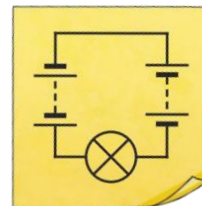
For a circuit to work, it must be 'complete'. If there is a break in the circuit, it is incomplete and the current cannot flow through it.



An **ammeter** can be used to measure the size of the electrical current flowing through a circuit.



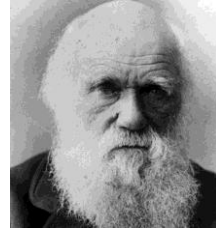
The brightness of a bulb or the volume of a buzzer relies on the number and voltage of cells used in the circuit.



Knowledge Organiser Year 6 Science: Evolution and Inheritance

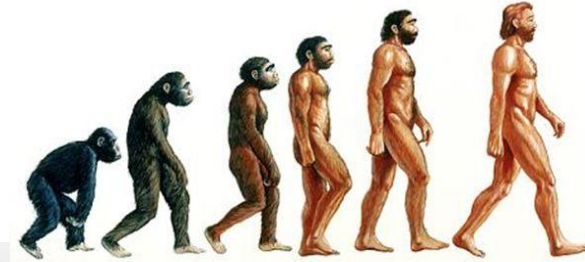
Concept: Evolution

Key Vocabulary	Things we already know
evolution	adaptation/ change over a very long time
adaptation	the process of change so that an organism or species can become better suited to their environment
descendant/ ancestor	a blood relative or an early type of animals or plant from which others have evolved
natural selection	the competition to survive, 'survival of the fittest'
environment	the surroundings or conditions in which a person, animal, or plant lives
reproduction	the production of offspring by a sexual or asexual process
offspring	a person's child or children/ an animal's young
inherit / inheritance	to gain a quality, characteristic or predisposition genetically from a parent or ancestor
artificial selection/ selective breeding	the process by which humans breed animals or plants to develop specific characteristics.
fossil	the remains or impression of a prehistoric plant or animal embedded in rock and preserved
body fossil	preserved remains of the body of the actual animal or plant itself
trace fossil	Indirect evidence of life in the past such as the footprints, tracks or waste left behind by animals



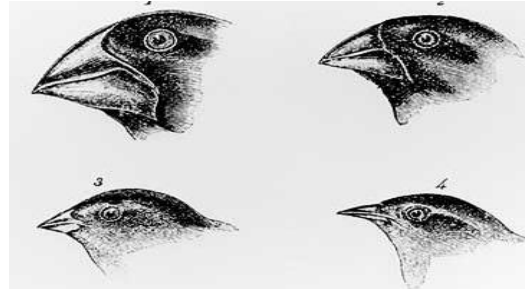
Charles Darwin (1809 - 1882) first proposed the idea of **evolution** through **natural selection** in his book 'On the Origin of Species'.

The Theory of Evolution



The theory states that all species of life have **descended** over time from common **ancestors**.

Evidence of evolution



Darwin realised that finches **adapted** their beaks to the different food sources that were available. This is known as **variation**.

Natural selection



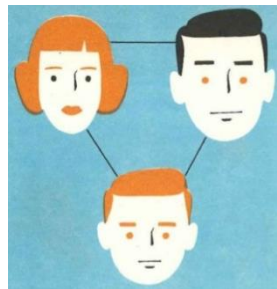
Each species is competing and must **adapt** to secure food to survive and produce **offspring**. Those that adapt best will survive, those that don't will become extinct!



Evidence of evolution can also be found in fossils and bones.

Examples of **adaptation** in nature

Inherited traits



Some of a parent's characteristics are passed down, or 'inherited', to their offspring; e.g. hair or eye colour.

Artificial selection



Plants / animals come from **common ancestors**. They can be bred to have certain characteristics; e.g. no seeds or long ears.

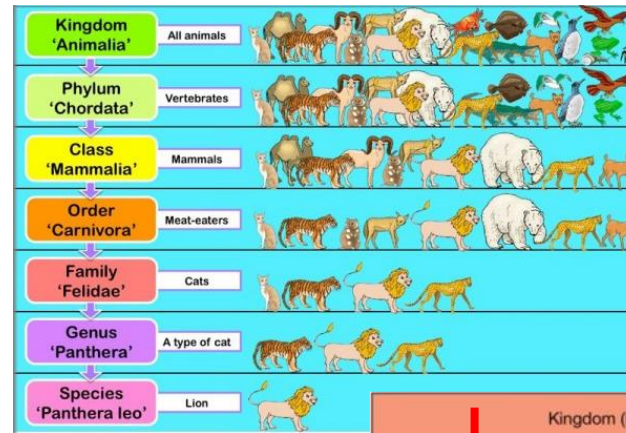
Living Things	Habitat	Adaptive Traits
polar bear	arctic	Its white fur enables it to camouflage in the snow.
camel	desert	It has wide feet to make it easier to walk in the sand.
toucan	rainforest	Its narrow tongue allows it to eat small fruit and insects.

Knowledge Organiser Year 6 Science: Living things

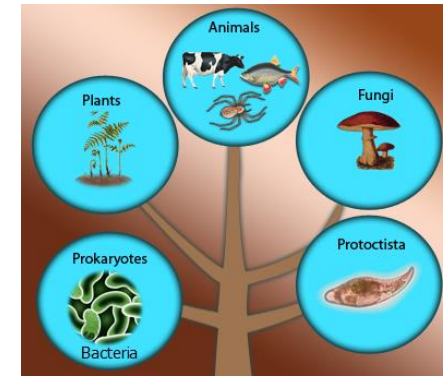
Concept: Evolution

Key Vocabulary	Things we already know
classification	the arrangement of organisms into groups based on their similarities and evolutionary relationships
taxonomy	the science of naming, identifying and classifying organisms
organism	an individual animal, plant or single-celled life form
micro-organism	an organism which is microscopic, making it too small to be seen by the human eye
bacteria	tiny organisms that are everywhere around us.
species	a group of closely related organisms that are very similar to each other and are usually capable of producing offspring
genus	the group an organism belongs to
vertebrate	an animal that has a backbone
invertebrate	an animal that does not have a backbone
mammal	an animal that gives birth to live young
amphibian	an animal with an internal skeleton that lives both in and out of water
reptile	animals that are cold-blooded., lay eggs and their skin is covered with hard, dry scales
insect	an animal with 6 legs

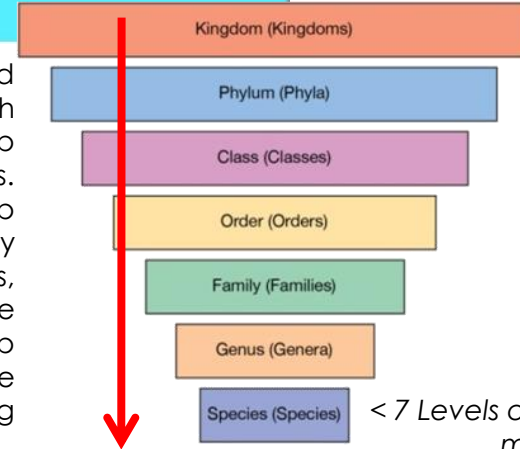
How plants/ animals are classified



The 5 Kingdoms



Living things are divided into groups, with members of each group having similar features. Each time we divide up the living things by particular characteristics, the groups become smaller until we end up with the a single organism identified.



Carl Linnaeus is famous for his work in **taxonomy**.

< 7 Levels of Classification model

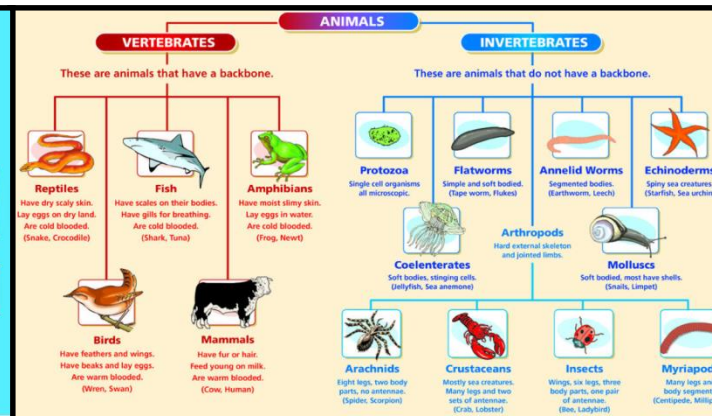
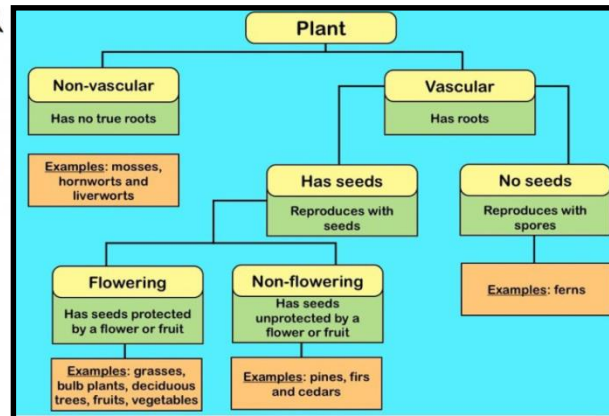
Classification of plants and animals

warm-blooded ANIMALS

Body temperature stays the same when its cold or hot outside.

Cold-blooded ANIMALS

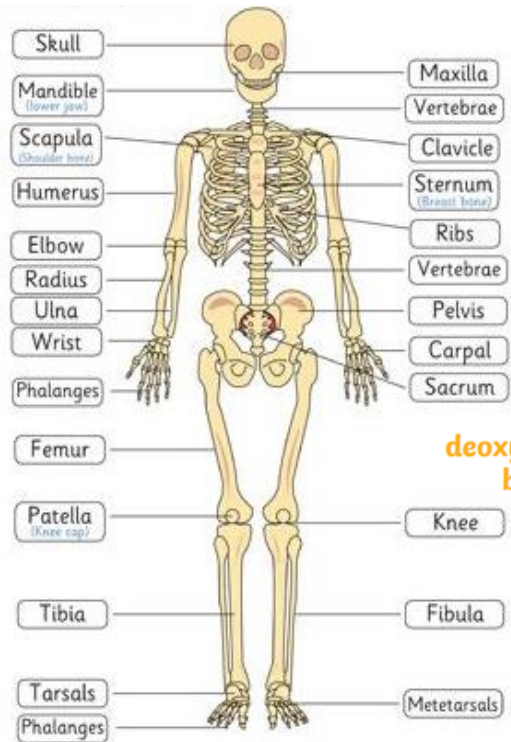
Body temperature depends on whether its cold or hot outside.



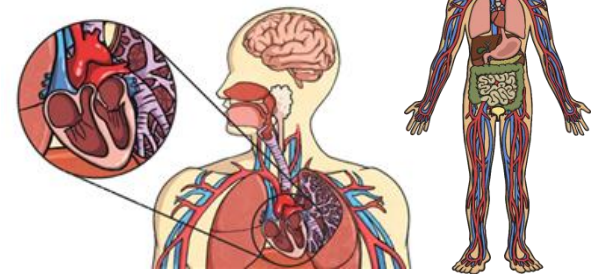
Knowledge Organiser Year 6 Science: Animals and Humans

Concept: Living things (cells)

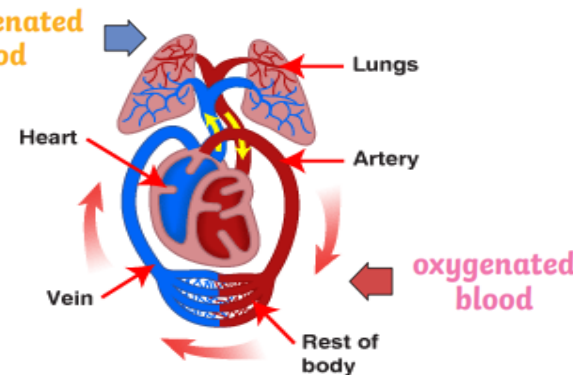
Key Vocabulary	Things we already know
circulatory system	the system responsible for circulating blood through the body, that supplies nutrients and oxygen to the body and removes waster products such as carbon dioxide
blood vessels	the narrow tubes through which your blood flows - <i>arteries, veins and capillaries are blood vessels</i>
capillaries	tiny blood vessels in your body
veins	a tube in your body that carries deoxygenated blood to your heart from the rest of your body
arteries	a tube in your body that carries oxygenated blood from your heart to the rest of your body
oxygenated	blood that contains oxygen
deoxygenated	blood that does not contain oxygen
respiration	process of respiring, breathing, inhaling and exhaling air
heart	the organ in your chest that pumps the blood around your body
lungs	two organs inside your chest which fill with air when you breathe in - <i>they oxygenate the blood and remove carbon dioxide from it</i>
nutrients	substances that helps plants and animals grow
organ	a part of your body that had a particular purpose



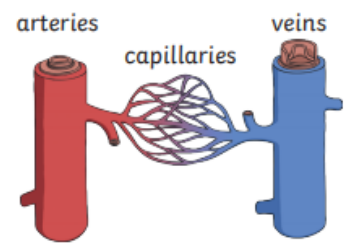
^ The bones in a human skeleton



The heart pumps blood to the lungs to get oxygen. It then pumps this **oxygenated** blood around the body. We call this the **circulatory system**.



The blood that comes from the body is **deoxygenated** and the blood that comes from the lungs is **oxygenated**.



Capillaries are the smallest **blood vessels** in the body and it is here that the exchange of water, nutrients, oxygen and carbon dioxide takes place.

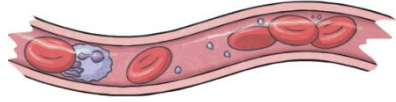
The human body needs a constant supply of blood to keep working.

As we exercise, our muscles need more **oxygen**. We breathe quicker so our lungs can take in more oxygen. Our heart rate increases to pump more blood to the active muscles.



Our blood transports:

- gases (mostly oxygen and carbon dioxide)
- nutrients** (including water)
- waste products



The human digestive system >

