

# Year 6 Physics: Electricity Knowledge Organiser

## Vocabulary

**electricity** a form of energy involving the flow of electrons used to power appliances

**component** part of an electrical circuit for example wire, bulb, buzzer, cell and switch

**cell** single unit ,source of electrical energy, pushes electrons around a circuit

**battery** converts stored energy into electrical energy and is formed by two or more connected cells

**battery terminals** are the electrical connections of a battery. There is a positive terminal and a negative terminal.

**switch** a component that can 'complete' or 'break' an electrical circuit, there are many different types of switches such as toggle, switch, slide, and pressure switches.

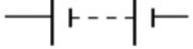
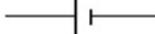
**series circuit** resistors are arranged in a chain, the current only has one path to take

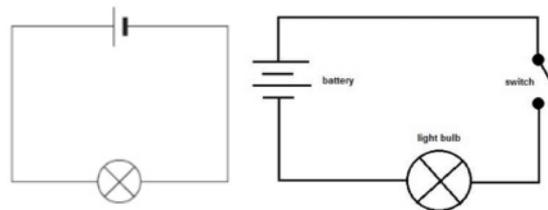
**current** a flow of electricity through a wire or circuit

**resistance** a force which slows down a moving object or vehicle

**fuel** a substance that is burned to provide heat or power

## Key Diagrams

Symbol	Component
	ammeter
	battery
	bulb
	buzzer
	cell
	motor
	resistor
	switch (open)
	switch (closed)



## Key Knowledge

1. There are several different things that can affect how components work in a circuit.

2. It is convention to use recognised symbols (see key diagrams) when drawing a circuit.

3. Switches are a way of controlling the flow of electricity (electrons) in a circuit

4. Changing the voltage of a circuit, by adding cells will make a bulb bright or a buzzer louder.

5. If the flow of electrons is broken a circuit will not work as it is not complete.

6. There are many ways of generating electricity including burning fossil fuels, using wind or water turbines, solar energy and nuclear power.

7. Electricity is generated in a power plant the transported through high voltage transmission lines before reaching substations where the voltage is lowered. It then travels through smaller distribution lines until it reaches its destination at a voltage of 230 Volts (V).

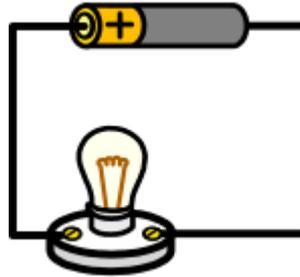
8. A bolt of lightning can measure up to 3,000,000 volts, and lasts less than one second!

9. Coal is the biggest source of energy for producing electricity. Coal is burned in furnaces that boil water and create steam.

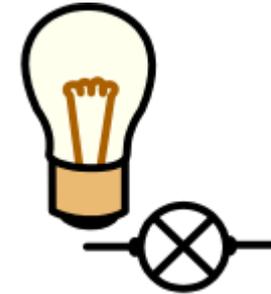
# Year 6 Physics: Electricity Knowledge Organiser



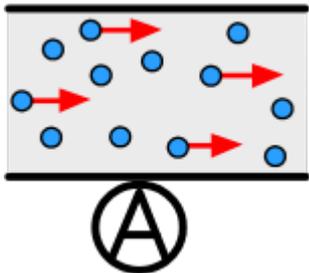
electricity



complete circuit



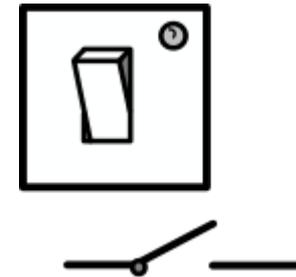
bulb



current



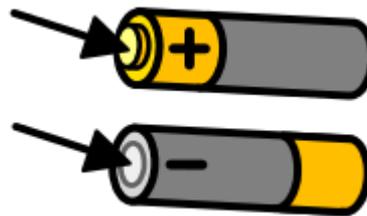
resistance



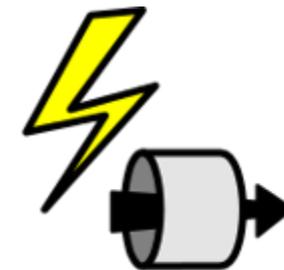
switch



fuel



battery terminal



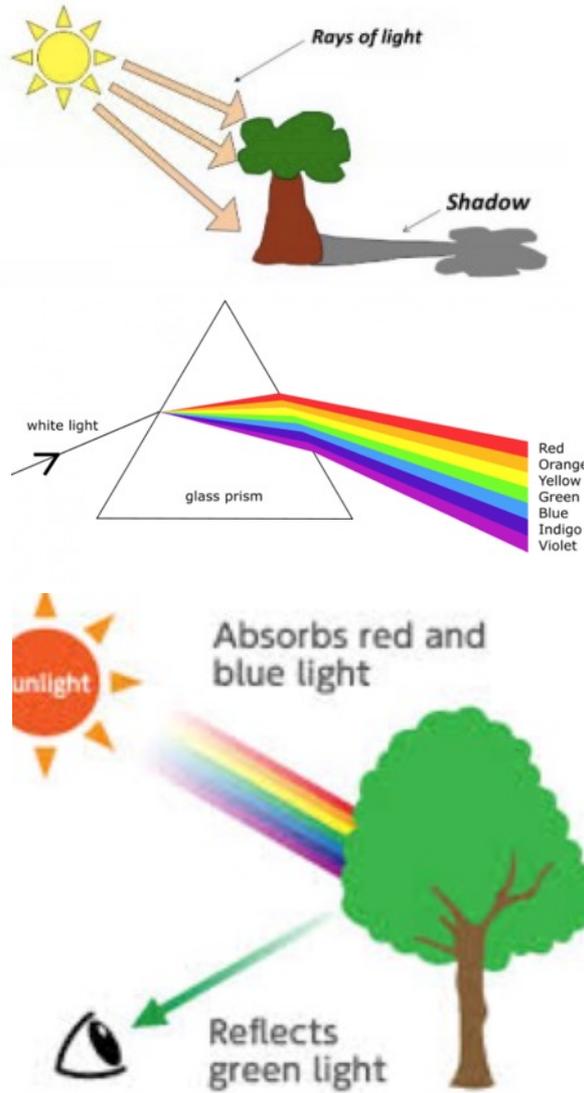
electrical conductor

# Year 6 Physics: Light Knowledge Organiser

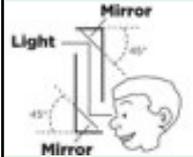
## Vocabulary

- light source** anything that produces light
- shadow** a dark shape on a surface that is made when something stands between a light and the surface
- transparent** if an object or substance is transparent, you can see through it
- translucent** if a material is translucent, some light can pass through it
- opaque** if an object or substance is opaque, you cannot see through it and light cannot pass through it
- reflect** sent back from the surface rather than pass through it
- emit** produce
- refraction** when light bends as it passes from one medium to another. e.g. from air to water
- periscope** a set of lenses, mirrors or prisms in a tube allowing an object reflected on the other end
- inverted** an image that is flipped either up and down or left and right
- spectrum** series of similar waves arranged in order of wavelength or frequency.
- dispersion** spreading out of the different wavelengths of light, caused by refraction of light as it passes through a prism.

## Key Diagrams



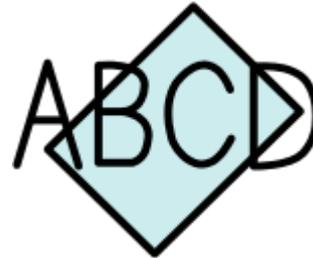
## Key Knowledge

- Light appears to travel in straight lines.
- Shadows have the same shape as the object because light travels in straight lines.
- We see things because light travels from a light source to an object. The object reflects the light which then travels to our eyes.
- When you look in a mirror the light travels from the light source to your face then to the mirror and back to your eye.
- In a periscope, light hits top mirror at  $45^\circ$  and away at the same light then travels bottom mirror. reflected light hits the second mirror it is reflected again at  $45^\circ$ , right into your eye.
 
- Light usually travels in straight lines but sometimes it can be bent in passing from one medium to another this is called refraction.
- White light is made up of red, orange, yellow, green, blue, indigo and violet light.
- A glass prism can be used to separate white light into its component colours.
- A rainbow is an example of white light refracted into its separate component colours.
- Light doesn't travel as fast when it has to pass through mediums that are different, such as air, water or glass.

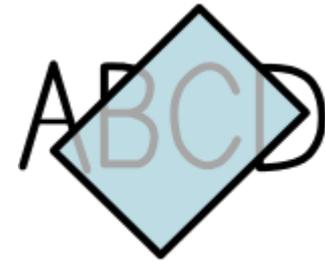
# Year 6 Physics: Light Knowledge Organiser



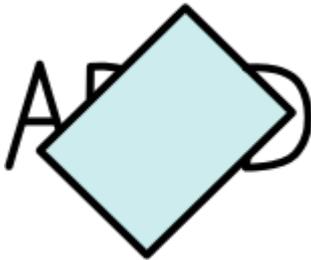
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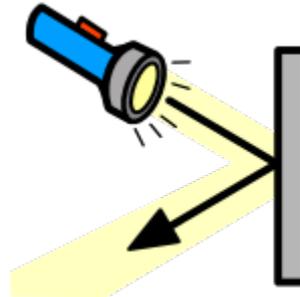
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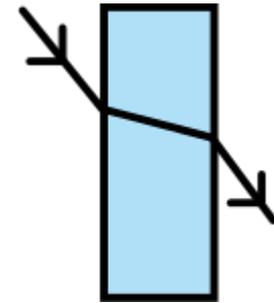
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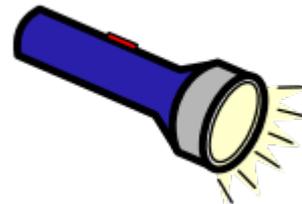
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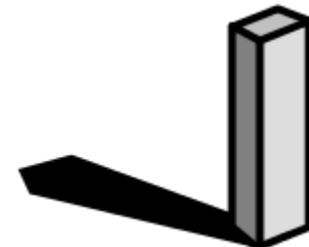
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# Year 6 Biology: Living things and their Habitats Knowledge Organiser

Vocabulary	Key Diagrams	Key Knowledge
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**organisms** are individual forms of life, such as a plant, animal, bacterium, or fungus

**classification** the grouping together of similar species of plant, animal and other organisms

**classification key** a way of identifying species, animals or materials through choosing one of two answers to a statement and then moving progressively through sets of statements until an identification or classification is made

**kingdoms** division of living things; monera, portista, fungi, plant and animal

**convention** a custom or a way of acting and doing things that is widely accepted and followed

**genus** rank in classification below family and above species.

**species** a class of plants or animals whose members have the same main characteristics and can breed with each other

**fungi** one of the five kingdoms, organisms that live by decomposing and absorbing the organic material in which they grow

**protista** single cell organisms

**monera** one of the five kingdoms of living organisms consisting of microscopic prokaryotic organisms that mostly reproduce by asexual fission, sporulation, or budding.

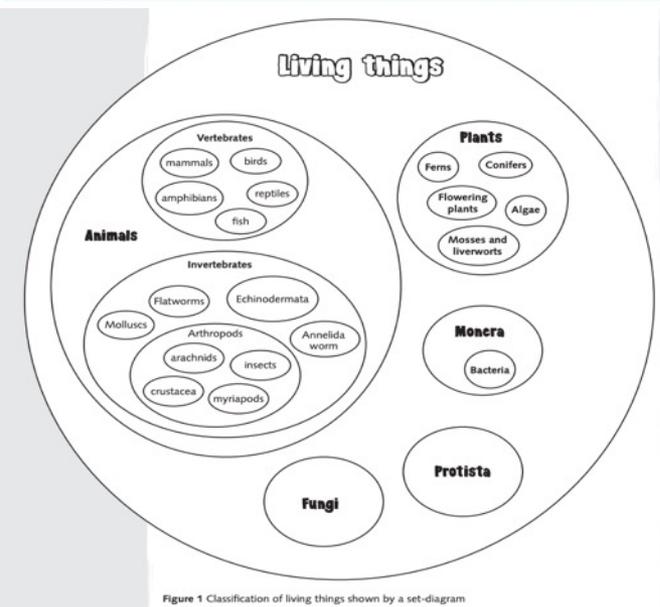
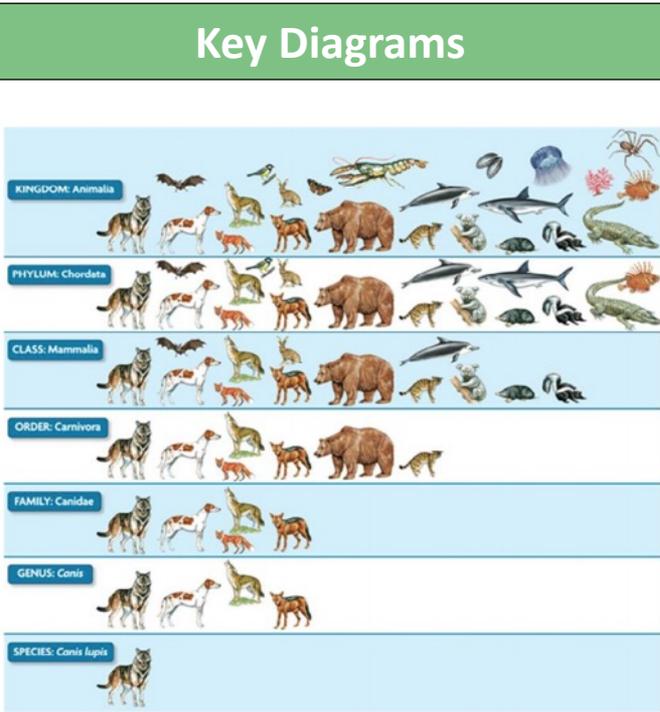


Figure 1 Classification of living things shown by a set-diagram

1. Living things are classified into broad groups according to common observable characteristics based on similarities and differences.

2. Living things are generally classified into 5 broad groups called kingdoms: animals, plants, monera, protista and fungi.

3. The 5 kingdoms are further classified into smaller groups until eventually they are classified into a species.

4. Observable characteristics to group and classify vertebrates and invertebrates.

5. Carl Linnaeus is famous for his work in Taxonomy, the science of identifying, naming and classifying organisms (plants, animals, bacteria, fungi, etc.) and scientists still use his system of naming plants and animals is still used today.

This system is known as the binomial system, whereby each species of plant and animal is given a genus name followed by a specific name (species), with both names being in Latin. For example, we are Homo sapiens. Homo is the genus that includes modern humans and closely-related species like Homo neanderthalensis (Neanderthals).

6. Classification requires scientists to identify the similarities of objects in order to group them.

7. Identification allows scientists to focus on the differences between living things, in order to be able to give a specific name to that particular thing.

8. Micro-organisms (bacteria, fungi and viruses), can be organised based on their common

# Year 6 Biology: Living things and their Habitats Knowledge Organiser

## Vocabulary

**off-spring** When living things reproduce they pass on characteristics to their offspring. All living things produce offspring of the same kind, but normally offspring are not identical to their parents

**Adaptation** is the process by which animals, plants and other living things have changed so that they better suit their habitat.

**Evolution** is the theory that all the kinds of living things that exist today developed from earlier types.

When living things reproduce they pass on characteristics to their offspring. This is known as **inheritance**.

A **palaeontologist** is someone studying the life of past geological periods, as known from fossil remains.

**Charles Darwin** was an English scientist who studied nature. He is known for his theory of evolution.

**Genes** that are passed on to you determine many of your traits, such as your hair colour and skin colour.

**Chromosomes** are tiny structures inside cells made from DNA and protein.

A **syndrome** is a genetic condition which can affect learning and physical features.

A **genotype** refers to a particular gene or set of genes carried by an individual

## Key Diagrams

Evolutionary time chart

Era	Period	Events
Cenozoic	<b>Quaternary</b> 2.6 million years ago – today	Evolution of humans
	<b>Neogene</b> 23 – 2.6 million years ago	Mammals diversify
	<b>Paleogene</b> 65-23 million years ago	Extinction of dinosaurs
Mesozoic	<b>Cretaceous</b> 145-65 million years ago	First primates First flowering plants
	<b>Jurassic</b> 200-145 million years ago	First birds Dinosaurs diversify
	<b>Triassic</b> 251-200 million years ago	First mammals First dinosaurs
	<b>Permian</b> 299-250 million years ago	Major extinctions Reptiles diversify
Paleozoic	<b>Carboniferous</b> 359-299 million years ago	<b>Pennsylvanian</b> First reptiles
		<b>Mississippian</b> Scale trees Seed ferns
	<b>Devonian</b> 419-359 million years ago	First amphibians Jawed fishes diversify
	<b>Silurian</b> 443-416 million years ago	First vascular land plants
	<b>Ordovician</b> 488-444 million years ago	Sudden diversification of metazoan families
	<b>Cambrian</b> 540-490 million years ago	First fishes First chordates
Late Proterozoic		First skeletal elements First soft bodied metazoans First animal traces

## Key Knowledge

1. Living things have changed over time this process is called evolution.

2. Fossils provide information about living things that inhabited the Earth millions of years ago.

3. Living things usually produce offspring of the same species however the offspring is often varied and not identical to its parents.

4. Living things are adapted to suit their environments in different ways. For example, animals that live in the Arctic are often White to help them camouflage with their surroundings

5. Evolution is a scientific theory used by biologists. It explains how living things changed over a long time, and how they have come to be the way they are.

6. We know that living things have changed over time, because we can see their remains in the rocks

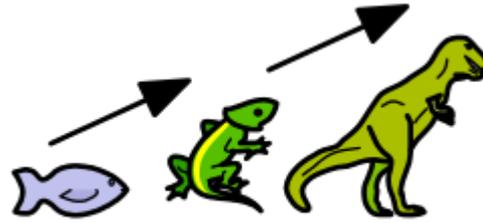
7. We know that the animals and plants of today are different from those of long ago.

8. Evolutionary questions are still being actively researched by biologists.

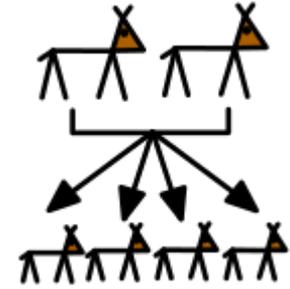
# Year 6 Biology: Evolution and Inheritance Knowledge Organiser



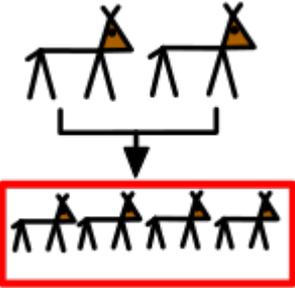
organism



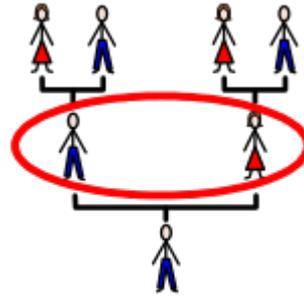
evolve



reproduce



offspring



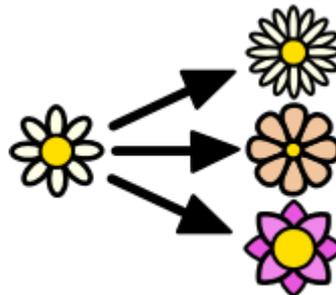
generation



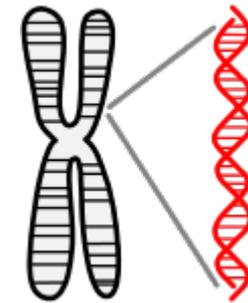
gene



fossil



variation



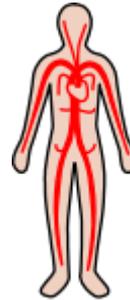
DNA

# Year 6 Biology: Body Pump Knowledge Organiser

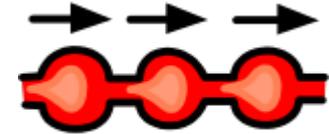
Vocabulary		Key Diagrams	Key Knowledge
<p><b>circulatory system</b> A system which includes the heart, veins, arteries and blood transporting substances around the body.</p>			<p><b>1. The main parts of the human circulatory system are the heart, blood vessels and the blood itself.</b></p>
<p><b>Heart</b> An organ which constantly pumps blood around the circulatory system.</p>			<p><b>2. The heart is a hollow muscular organ that pumps blood around the circulatory system.</b></p>
<p><b>blood vessels (veins, arteries, capillaries)</b> The tube-like structures that carry blood through the tissues and organs. <b>Veins, arteries</b> and <b>capillaries</b> are the three types of blood vessels.</p>			<p><b>3. Blood vessels are the tubular structures, including arteries, veins and capillaries, that carry blood through the body.</b></p>
<p><b>oxygenated blood</b> has more oxygen. It is pumped from the heart to the rest of the body.</p>			<p><b>4. Diet, exercise, drugs and lifestyle can all have a positive or negative effect on how the body functions.</b></p>
<p><b>deoxygenated blood</b> is blood where most of the oxygen has already been transferred to the rest of the body.</p>			<p><b>5. Nutrients and water are transported through the body in the blood.</b></p>
<b>blood</b>	<p><b>Plasma</b> is the liquid. The other parts of your blood are solid.</p>		<p><b>6. Diffusion and osmosis are the processes that allow nutrients and water to move from the blood to the parts of the body they are needed.</b></p>
	<p><b>Platelets</b> help you stop bleeding when you get hurt. They cause blood to <b>clot</b>.</p>		<p><b>7. Blood itself carries materials around the body and is made up of red blood cells, white blood cells, platelets and plasma.</b></p>
	<p><b>red blood cells</b> carry oxygen through your body.</p>		
	<p><b>white blood cells</b> fight infection when you are sick.</p>		
<p><b>Nutrients</b> Substances that animals and humans need to stay alive and healthy.</p>			



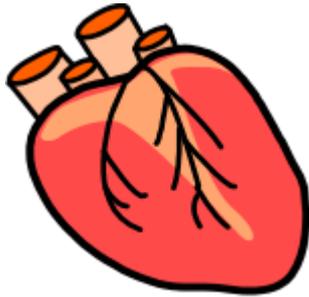
blood



veins



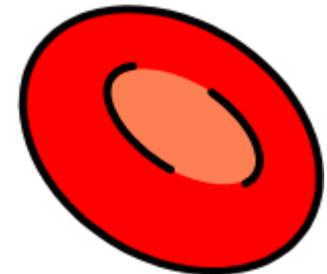
artery



heart



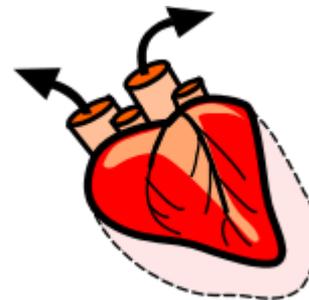
heart chambers



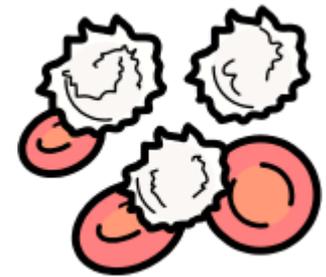
red blood cells



heart rate



pump



white blood cell