

# Metals

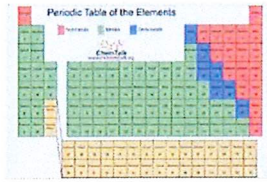
## Threshold Concept

Identify most metals have similar properties

## Metals and non metals

Most elements on the periodic table are metals. They are grouped together in the middle to the left-hand side of the periodic table.

Non metals are on the right-hand side.



## Keywords

**Metal**..... DEFINITION

**Non metal** ..... DEFINITION

**Property** ..... a characteristic of a particular substance

**Reaction** ..... a process that leads to the change of one set of chemical substances into another

**Alloy** ..... a mixture of two or more metals, or a metal and a non-metal

**Displacement** ..... A more reactive metal will displace a less reactive metal from its compound.

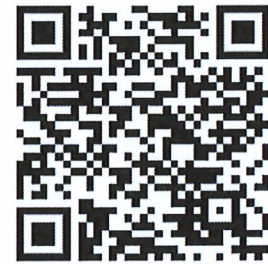
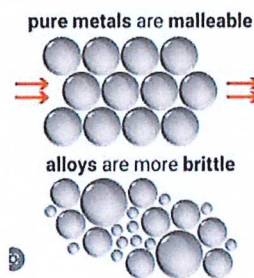
## Physical properties of metals

Properties	Metals	Non-metals
Appearance	Shiny	Dull
Hardness	Very hard or hard	Brittle
Malleability	Malleable	Non-malleable
Ductility	Ductile	Non-ductile
Heat conduction	Good conductor	Bad conductor
Conduction of electricity	Good conductor	Bad conductor
State	Solid	Solids, liquid, gases
Density	Higher	Lower

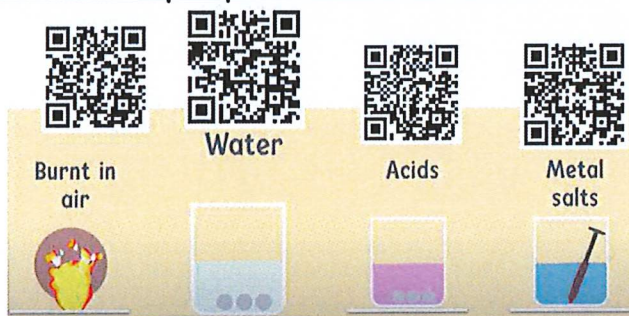


## Metals and alloys

Making alloys changes the metals properties by changing its structure. Alloying is done for many reasons, typically to increase strength, increase corrosion resistance, or reduce costs



## Chemical properties of metals



## Practical - Displacement reactions

**1** Metal

**2** Sulfate

**3** What did you see?

	Magnesium	Zinc	Copper
Magnesium sulfate	X	○	○
Zinc sulfate	○	X	○
Copper sulfate	○	○	X



## The reactivity series

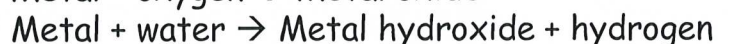
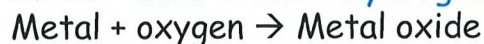
potassium most reactive  
sodium  
calcium  
magnesium  
aluminium  
carbon  
zinc  
iron  
tin  
lead  
hydrogen  
copper  
silver  
gold  
platinum least reactive



The Reactivity Series lists metals in order how easily they react with other substances



## Equations for this topic

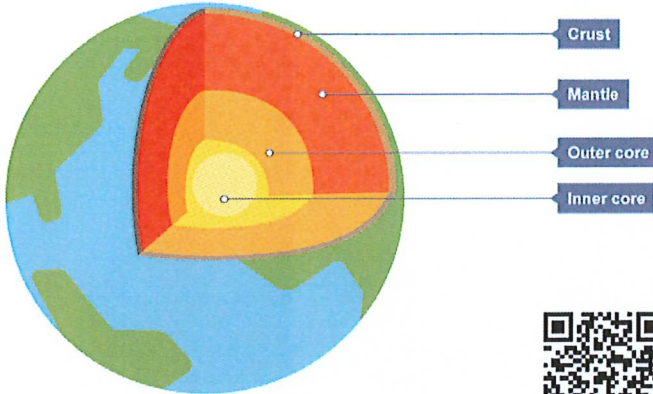


# Space

## Threshold Concept

The Sun is the centre of the Solar system

## The earth:



## Keywords

- **Earth:** The Earth is a planet and is roughly the shape of a sphere. There are three layers that make up the Earth's structure.
- **Planet:** A sphere of rock or gas orbiting a star.
- **Sun:** The Sun is our nearest star. It is a relatively small star when compared to other stars in the universe. Our Solar System contains the Sun and everything that orbits it.
- **Gravity:** Gravity is an attractive force that acts on all matter.

## Solar system:

Our solar system consists of eight planets orbiting a star, our sun. Most planets have at least one moon orbiting it. In addition, there is an asteroid belt between Mars and Jupiter. Numerous comets also orbit the sun in elongated elliptical orbits



## The earths rotation and revolution:

### rotate

To Spin or Turn



**TAKES:**

24 hours or 1 day

**CAUSES:**

Day & Night

### revolve

Go Around

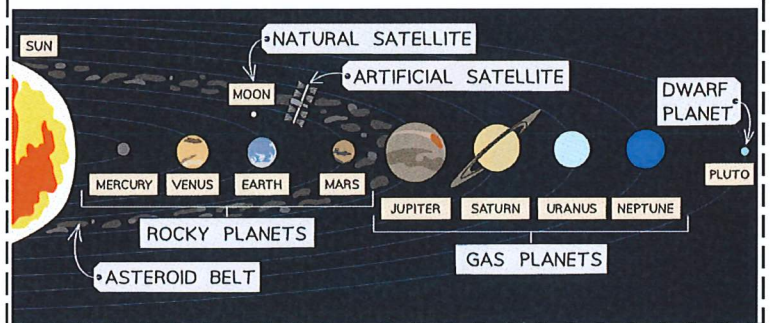


**TAKES:**

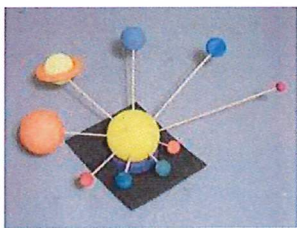
365 days or 1 year

**CAUSES:**

The Seasons



## Modelling the solar system:



A scale model is a copy of something that is much larger or smaller than the object itself but one which maintains the original's proportions.

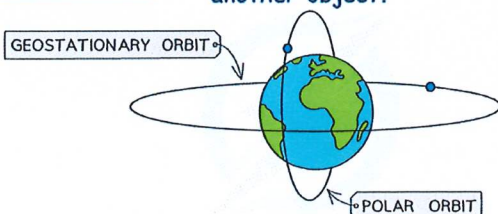
## The universe:

An orbit:

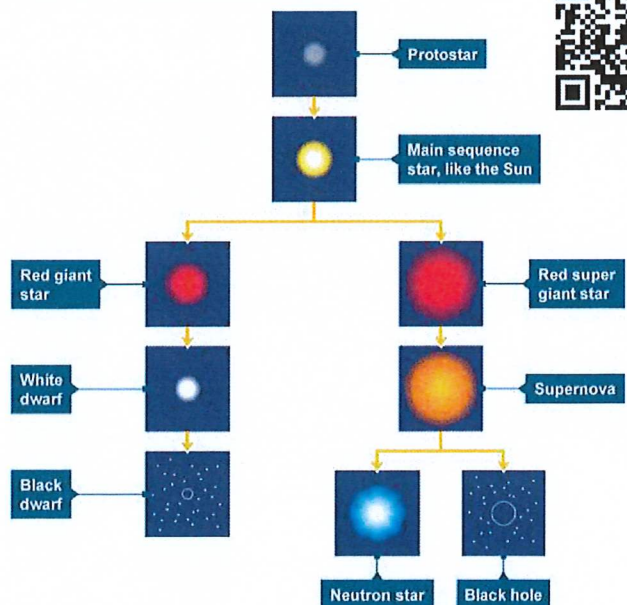
a curved path that an object takes around another object.

A satellite:

an object that orbits around another object.



## Stars and lifecycle:



## Equations for this topic

# Electricity (Part 1)

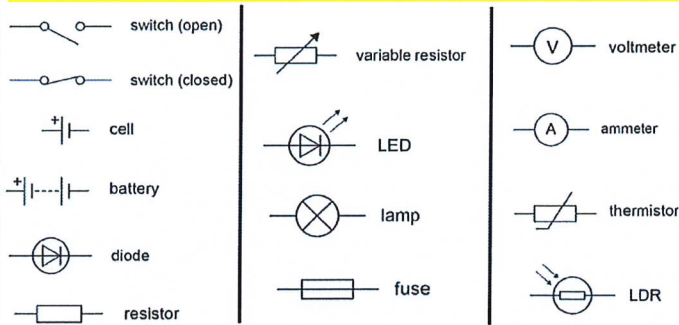
## Threshold Concept

Electricity is the flow of electrons.

## Circuit Symbols

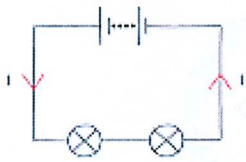


An electronic circuit can include lots of different components. All of which can be represented with a symbol:



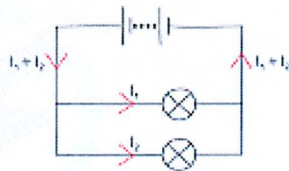
## Series and Parallel circuits

### SERIES



THE CURRENT IS THE SAME EVERYWHERE

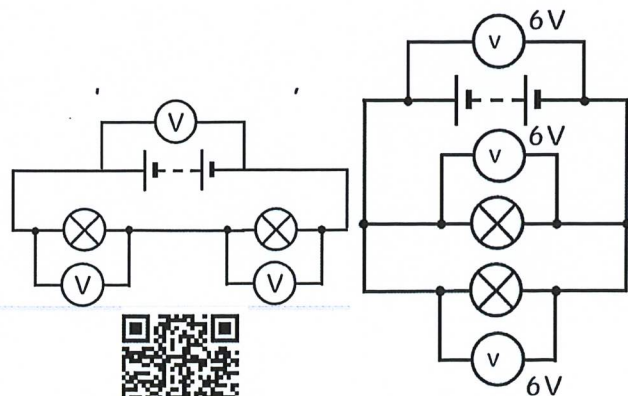
### PARALLEL



THE CURRENT SPLITS INTO TWO SMALLER CURRENTS

In a series circuit, the potential difference/voltage supplied by the battery is **shared** by the components.

In a parallel circuit, the potential difference across each bulb is the **same** as the potential difference across the battery.



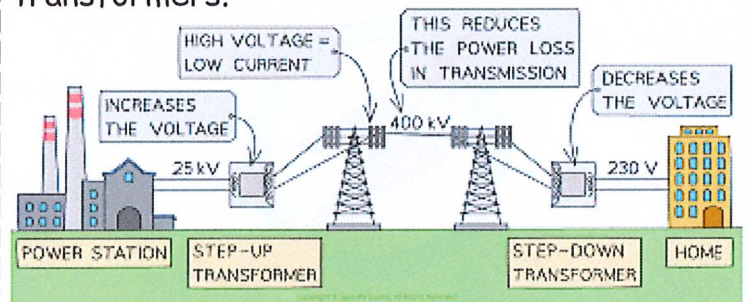
## Keywords

- **Electron:** a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
- **Electricity:** is the presence or flow of charged particles.
- **Charge:** is a property of a body which experiences a force in an electric field. Charge is measured in coulombs (C).
- **Current:** Current is the rate of flow of electric charge around a circuit.



## National Grid

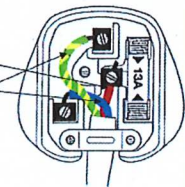
The **National Grid** distributes electricity across the country. The National Grid connects power stations to homes, workplaces and public buildings all around the country through a system of cables and transformers.



## Practical

Wiring a plug

- The live wire.
- The neutral wire.
- The earth wire.

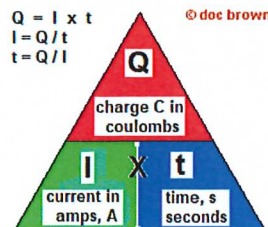


## Equations for this topic

$$Q = I \times t$$

$$I = Q / t$$

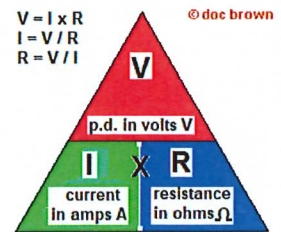
$$t = Q / I$$



$$V = I \times R$$

$$I = V / R$$

$$R = V / I$$



# Rock Cycle

## Threshold Concept

Understand that rocks change within 3 types over time.

## Types of rocks

### Sedimentary rocks

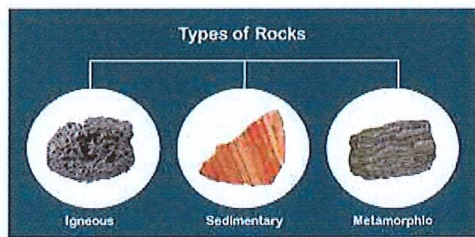
Sedimentary rocks are formed from sediments that have settled at the bottom of a lake, sea or ocean, and have been compressed over millions of years.

### Metamorphic rocks

Metamorphic rocks are formed from other rocks which change due to heat or pressure.

### Igneous rocks

Igneous rocks are formed from molten (liquid) rock that has cooled and solidified.

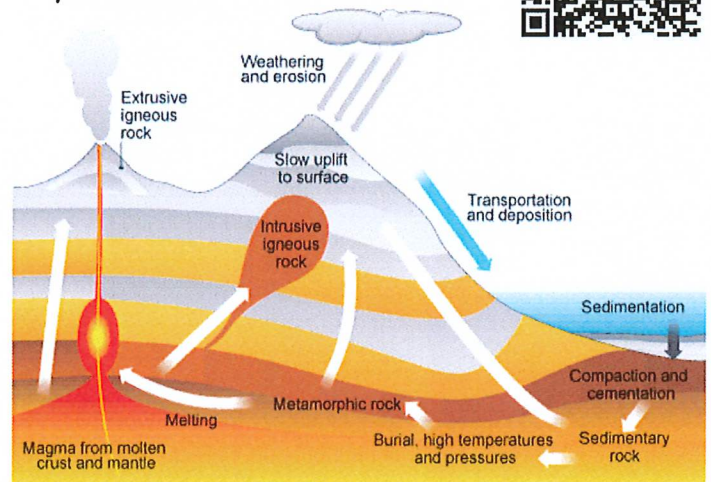


## Keywords

- **Rock:** The solid mineral material forming part of the surface of the earth and other similar planets, exposed on the surface or underlying the soil.
- **Earth:** The planet on which we live; the world.
- **Cycle:** Move in or follow a regularly repeated sequence of events.
- **Temperature:** The degree or intensity of heat present in a substance or object.
- **Pressure:** Continuous physical force exerted on or against an object by something in contact with it.

## The rock cycle

Rocks on earth do not always stay the same.



Rocks are continually changing due to processes such as, weathering, erosion and large earth movements. The rocks are gradually recycled over millions of years, changing between the different rock types.

## Types of weathering

### 1. Biological weathering

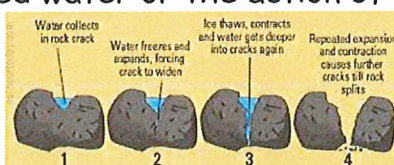
This describes rocks being broken up by the roots of plants, or animals burrowing into them.

### 2. Chemical weathering

This describes rocks being broken up because substances in rainwater, rivers and seawater or the air, react with the in the rocks.

### 3. Physical weathering

This describes rocks being broken up by changes in temperature, freezing and thawing of trapped water or the action of waves and rivers.



## Required practical

## Equations for this topic