Particle Models of Matter

Threshold Concept

Changes of state are caused by energy changes

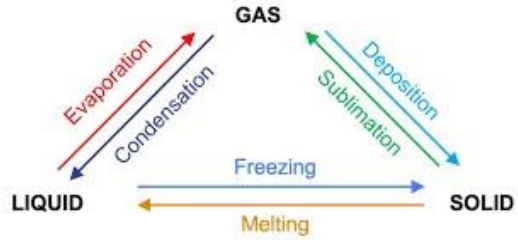
Keywords

States of matter – solid, liquid or gas.
Particles – the smallest part that a substance can be broken down into.
Energy – a property of a substance that is stored or transferred in order for things to be done.
Density – how compact a substance is.
Pressure – continuous force acted on or against an object.

States of matter

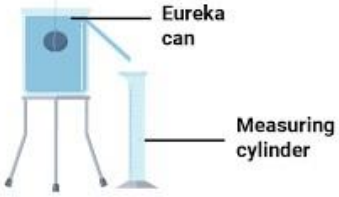
Solid Liquid Gas

Changes of state

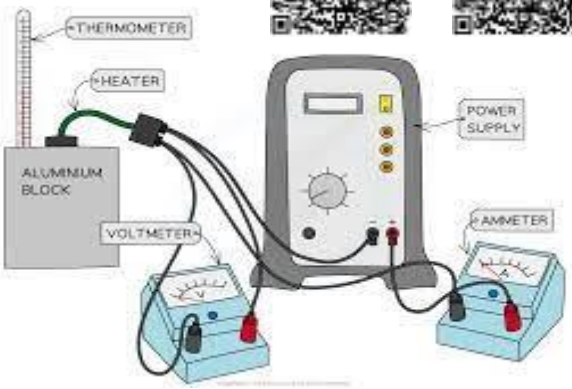


Required Practical

Density



Specific Heat Capacity



Links to information on the whole topic, consisting of slides, videos, and quizzes

Equations for this topic

P=F/A Pressure = Force / Area

P = m/V Density = mass / volume

ΔE = m x c x Δθ Change in Energy = mass x specific heat capacity x change in temperature

ΔE = m x L Change in Energy = mass x Specific Latent Heat

P = ρ x g x h Pressure in a liquid column = density x gravity x height (TRIPLE ONLY)

For gases: p x v = constant For Gases: pressure x volume = constant (TRIPLE ONLY)

Electromagnetism

Threshold Concept

Magnets have two poles that attract or repel.

Keywords

Permanent Magnet - A material that has its own magnetic field without needing to be helped by another magnetic material.
Induced Magnet - a material that only becomes a magnet when placed in another magnetic field.
Magnetic Field - a region around a magnet where the force of magnetism acts.
Solenoid - a coil of wire that carries an electrical current.
Electromagnet - a soft, iron core placed inside a solenoid.

Common magnetic materials

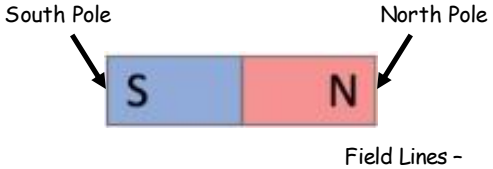
Iron

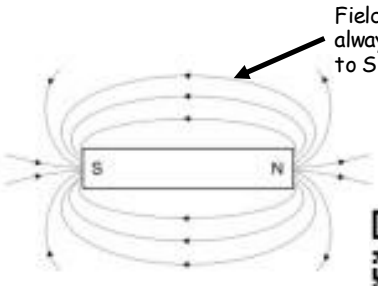
Nickel

Cobalt

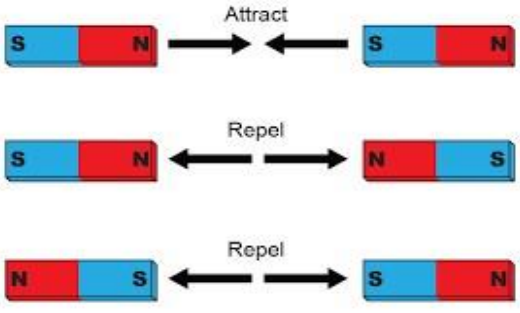
Steel

A bar magnet and its magnetic field





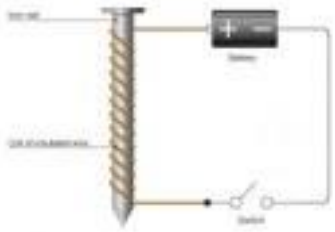
Attraction and repulsion



Electromagnets

Building an electromagnet

Electromagnets



Required Practical

Equations for this topic

Force = Magnetic Flux Density x Current x length of wire

$F = B \times I \times l$