Atomic Structure

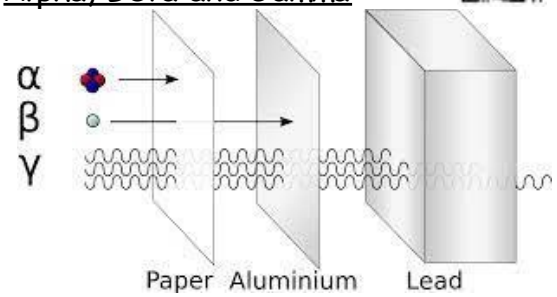
Threshold Concept

Identify that there are three types of radiation

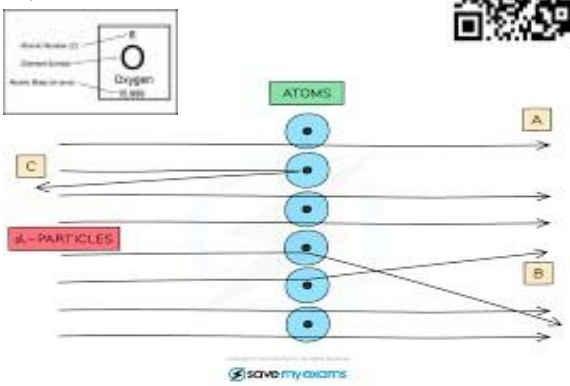
Keywords

Atom – the smallest particle of a chemical element that can exist
Proton – positively charged particle
Neutron – Particle with no charge
Electron – Negatively charged particle
Wave – Energy transfer method

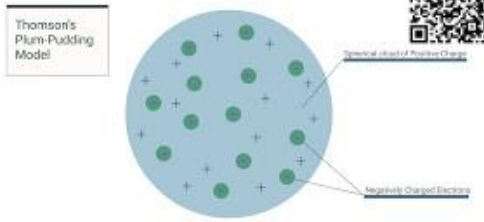
Alpha, Beta and Gamma



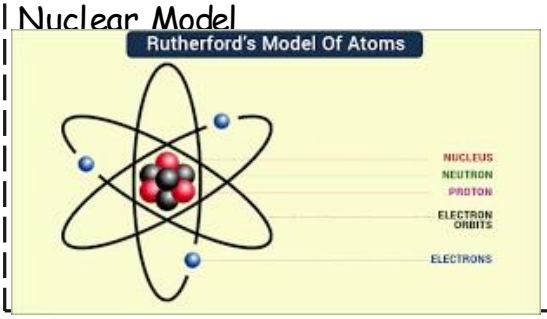
Rutherfords Scattering Experiment



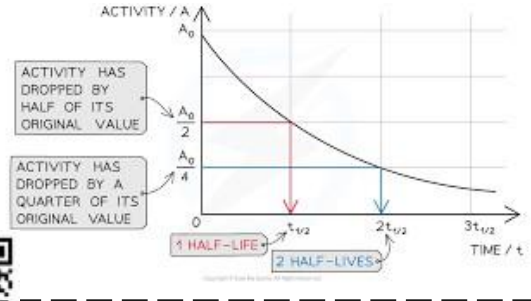
Plum Pudding Model



Nuclear Model



Half Life



Uses and Dangers of Radiation

	Irradiation	Contamination
Description	Object is exposed to radiation but does not become radioactive	Object becomes radioactive and emits radiation
Source	Danger is from radiation emitted outside the object	Danger from radiation emitted within the object
Prevention	Prevented by using shielding, such as lead clothing	Prevented by safe handling of sources and airtight safety clothing
Causes	Caused by the presence of radioactive sources outside the body	Caused by inhalation or ingestion of radioactive sources

uations for this topic

$$^{235}_{92}U \xrightarrow{\text{decay by releasing an alpha particle}} {}^{4}_{2}\alpha + {}^{231}_{90}Th$$

$$^{14}_{6}C \xrightarrow{\text{decay by releasing an beta particle}} {}^{0}_{-1}\beta + {}^{14}_{7}N$$

$$^{235}_{92}U \xrightarrow{\text{decay by releasing a gamma wave}} {}^{0}_{0}\gamma + {}^{235}_{92}U$$

Particle Models of Matter

Threshold Concept

Changes of state are caused by energy changes

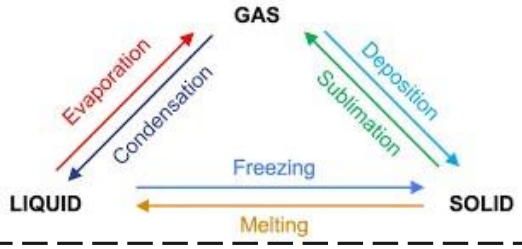
Keywords

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

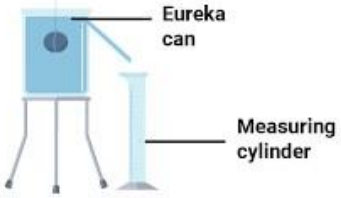
Changes of state



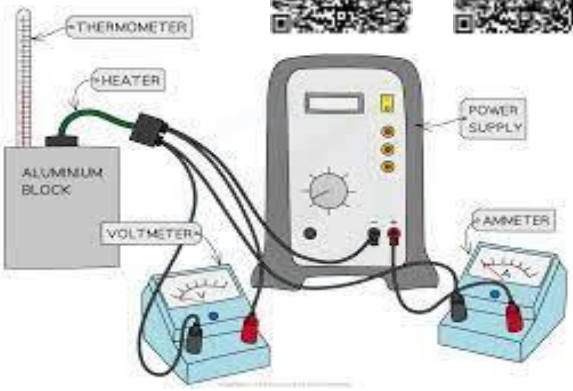
Links to information on the whole topic, consisting of slides, videos, and quizzes

Required Practical

Density



Specific Heat Capacity



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)