Subject: Physics **Year 10 Autumn Term 1—P1 The Particle Model**

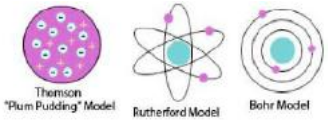
Section A: Key Vocabulary

Tier 3 vocabulary	Definition
Mass (n)	The amount of matter, measured in kilograms, kg.
Volume (n)	The amount of space an object takes up in metres cubed, m^3.
Density (n)	Mass/volume measured in kg/m^3.
Joule, J (n)	The unit of energy. 1kJ is 1000J.
Specific heat capacity (n)	The energy required to raise the temperature of 1kg of a substance by 1^oC in J/kg ^oC.
Specific latent heat of fusion (n)	The energy required to fuse or melt 1kg of a substance (with no temperature change) by 1^oC in J/kg ·
Specific latent heat of vaporisation (n)	The energy required to vaporise or condense 1kg of a substance (with no temperature change) by 1^oC in J/kg ·
Internal energy (n)	The energy of a substance due to the arrangement and movement of the particles in it.
Change of state (v)	The process of moving from one state of matter to another e.g. melting.
Pascal, Pa (n)	The unit of pressure. 1Pa is equal to $1N/m^2$.
Tier 2 vocabulary	**Definition**
Model (n)	A three-dimensional representation of a thing or of a proposed structure.
Calculate (v)	Determine (the amount or number of something) mathematically.
Demonstrate (v)	Give an practical exhibition or explanation of how something is performed).
Rearrange (v)	Change the position of.
Approximate (v)	Come close or be similar to something in quality, nature, or quantity.
Hypothetical (n)	A hypothetical proposition or statement.

Section B: Important Information

Models of the atom

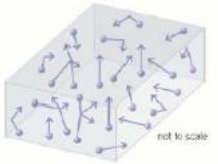
J. J. Thompson: the "Plum Pudding" model.	Rutherford: the nuclear model	Bohr model
Negative 'plums' embedded in a positive 'dough'.	Electrons around a positive nucleus.	Electrons in fixed energy levels around a positive nucleus.



Pressure in gases

Particles hit the sides of a container causing pressure. Pressure can be increased by decreasing the size of the container, increasing the amount of particles and heating the particles.

Pressure, Pa = Force, N / Area, m2



Density equation

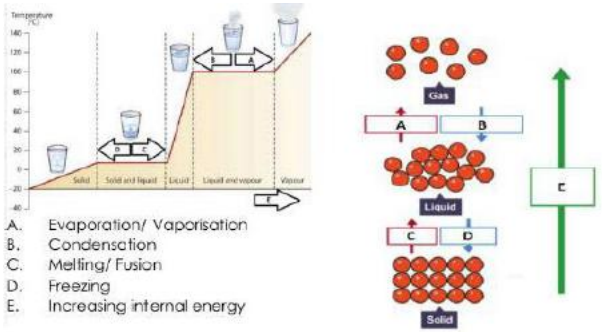
The equation can be rearranged to calculate mass and volume.

Mass = density x volume

Volume = mass / density

Section C: Diagrams

Changes of state



The graph shows how the temperature of a substance varies as it is changing state. The temperature remains the same during a change of state, as the energy is being used to break bonds between the particles, rather than raise the temperature.

The second picture shows the particle arrangement in different changes of state.

Density equation

$$\rho = \frac{m}{V}$$

Symbol	Meaning	Unit
ρ	density	kg/m^3
m	mass	kg
V	volume	m^3