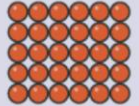
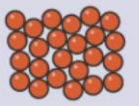

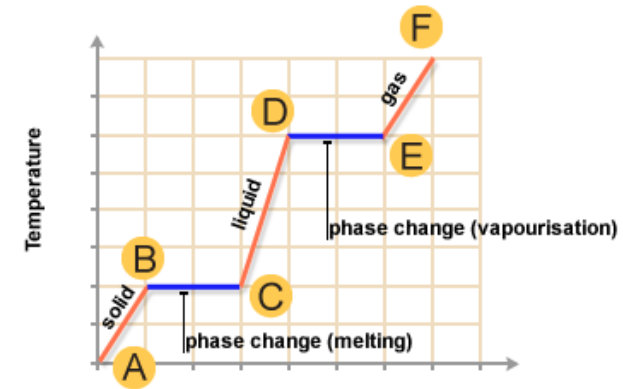
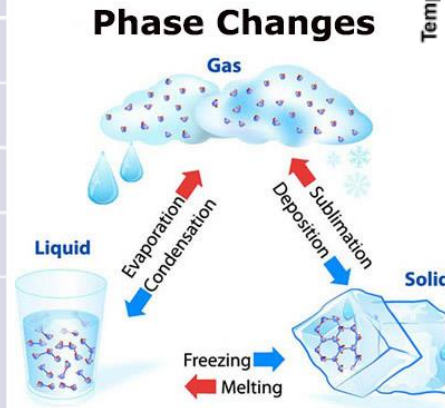


# Year 9 Particle Physics.

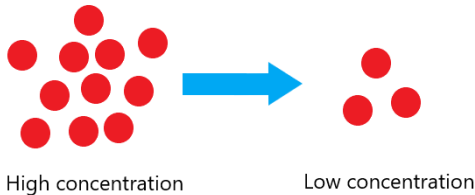
## The three states of matter

State	Solid	Liquid	Gas
Closeness of particles	Very close	Close	Far apart
Arrangement of particles	Regular pattern	Randomly arranged	Randomly arranged
Movement of particles	Vibrate around a fixed position	Move around each other	Move quickly in all directions
Energy of particles	Low energy	Greater energy	Highest energy
2D diagram			



During a change of state, the temperature remains the same as energy absorbed is used to break bonds.

## Diffusion



- Diffusion is the movement of a substance from an area of **high concentration** to an area of **lower concentration**.
- Diffusion occurs in liquids and gases when their **particles** collide randomly and spread out.
- Diffusion is an important process for living things - it is how **substances** move in and out of cells.

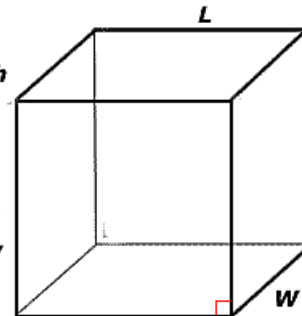
Diffusion is affected by: temperature, concentration gradient, distance, surface area.

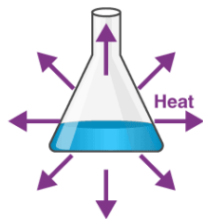
$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Volume of a Cube

$$\text{Volume} = L \times W \times h$$

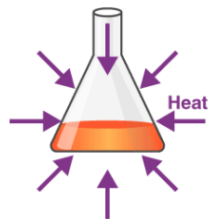
Like a rectangular solid, multiply the length, times the width times the height.





#### Exothermic Reactions

A reaction that releases energy from the system in the form of heat.



#### Endothermic Reaction

A reaction that the system absorbs energy from its surrounding in the form of heat.

© Byjus.com

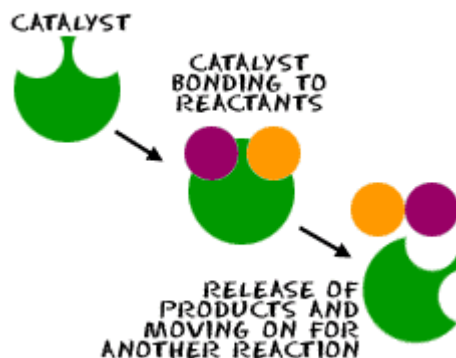
Examples of exothermic reactions:

- Combustion
- Oxidation
- Neutralisation.

Examples of endothermic reactions.

- Thermal decomposition.
- Reaction between citric acid and sodium hydrogen carbonate.
- Photosynthesis

**Catalysts** – speed up chemical reactions but remain unchanged at the end.



Catalysts lower the energy required to break the chemical bonds. They are important in industrial processes. They allow chemical reactions to happen at lower temperatures.

## The reactivity series of metals.

This is a list of metals from the most reactive to the least reactive.

Reactivity series of metals	
Potassium	Most reactive  Least reactive
Sodium	
Calcium	
Magnesium	
Aluminum	
Zinc	
Iron	
Tin	
Lead	
Copper	
Silver	
Gold	
Platinum	

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

1. **Iron** + **Copper** Sulphate → **Iron** Sulphate + **Copper**
2. **Copper** + **Silver** Nitrate → **Copper** Nitrate + **Silver**
3. **Sodium** + **Zinc** Carbonate → **Sodium** Carbonate + **Zinc**