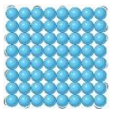




8 Fluids

1. The Particle Model

States of Matter	The three forms that a substance can be in; solid, liquid or gas.
Solid Properties	Do not flow, fixed shape, fixed volume, cannot be compressed
Liquid Properties	Can flow, no fixed shape, fixed volume, cannot be compressed
Gas Properties	Can flow, no fixed shape, no fixed volume, can be compressed
Particle Theory	Used to explain the different properties and observations of solids, liquids and gases.
Solid Particle Properties	Fixed arrangement of particles held closely together that cannot move over each other but vibrate. 
Liquid Particle Properties	Held closely together but not in a fixed arrangement and can move over each other. 
Gas Particle Properties	Far apart from each other and free to move about in all directions. 
Diffusion	The movement of particles spreading out and mixing with each other without anything moving them.

Brownian Motion	An erratic movement of small specks of matter caused by being hit by the moving particles that make up liquids or gases.
Expanding	Materials expand when heated because the particles vibrate more, taking up more space.
Contract	Materials contract when cooled because the particles vibrate less and take up less space.
Density	The mass of a certain volume of a material. $\text{density} = \frac{\text{mass}}{\text{volume}}$

2. Changing State

Changes of State	Changing from one state of matter to another. Physical changes because no new chemicals are made.
Melting	Turning from a solid to a liquid- occurs at melting point
Freezing	Turning from a liquid to a solid- occurs at freezing point
Condensing	Turning from a gas into a liquid.
Sublimation	Turning from a solid to a gas.
Evaporation	Turning from a liquid into a gas. Can occur at the surface of a liquid at any temperature.
Boiling	When evaporation occurs within a liquid- occurs at the boiling point
Pure	A substance made up of a single type of atom or compound.
Pure Substances Changing State	Occurs at a set temperature. The temperature stays constant when changing state as bonds are broken or made.

Mixtures Changing State	Occurs over a range of temperatures as it contains substances with different melting/boiling points.
Water	Contracts as it is cooled up until 4°C and then it expands slightly. Ice takes up more space than water and is less dense

3. Pressure in Fluids

Fluids	Liquids and Gases
Pressure	The force of particles hitting things- comes from all directions in gases and liquids.
Pressure Units	Pascals (Pa) One pascal is the a force of one newton on every square metre.
Atmospheric Pressure	The pressure of the air- 100,000 Pa
Tyres	Contain air under high pressure because they are pumped with extra air causing more particles to hit the inside walls.
Temperature	Pressure in fluids increases as you increase temperature because particles move faster and hit the walls of the container harder.
Volume	If you compress a gas into a smaller volume the pressure increases because the particles hit the walls more.
Pressure From Above	As you go down the ocean there is more water above you so pressure increases. As you go up a mountain there is less air above you so pressure decreases.

4. Floating and Sinking

Upthrust	The force of water pushing upwards.
Weight	The amount of force with which gravity pulls on a mass.
Water	The density of water is 1 g/cm ³
Floating	If something has a density less than water it will float in water.
Sinking	If something has a density greater than water it will sink in water.
Air	The density of air at sea level is around 0.001 g/cm ³
Hot Air Balloons	Fly because the overall density of the balloon is less than the air around it.

5. Drag

Drag	A resistance force acting on an object to slow it down.
Water Resistance	Type of drag that occurs in water.
Air Resistance	Type of drag that occurs in air.
Friction	Partly causes the drag on a moving object.
Streamlined	Smooth shape to reduce air / water resistance.
Speed	The faster an object is moving, the greater the drag.
Balanced Forces	Equal forces acting in opposite directions.
Engine	Forward force of an engine needs to balance the drag.

Lesson	Memorised?
1. The Particle Model	
2. Changing State	
3. Pressure in Fluids	
4. Floating & Sinking	
5. Drag	