

Name:
Science Class:
Teacher:
Hand in day:

Y7 Science

Term 1: Homework Booklet

Chemistry

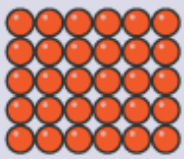
	Hand in Date	Parents Signature
Particle Model		
Homework 1		
Homework 2		
Homework 3		
Homework 4		
Homework 5		

Particle Model Homework 1:

Comprehension Task

Everything is made up of **tiny particles**. The **properties** of a substance depend on what its particles are like, how they move and how they are arranged. The particles in a substance are the same whether it's in the solid, liquid or gas state, but their **arrangement and movement** change.

The three states of matter are solid, liquid and gas. The particle model represents particles by small, solid spheres. It describes the arrangement, movement and energy of particles in a substance. The model can be used to explain the properties of solids, liquids and gases.

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			

Solids

- have a fixed shape and cannot flow, because their particles cannot move from place to place
- cannot be compressed (squashed), because their particles are close together and have no space to move into

Liquids

- flow and take the shape of their container, because their particles can move around each other
- cannot be compressed, because their particles are close together and have no space to move into

Gases

- flow and completely fill their container, because their particles can move quickly in all directions
- can be compressed, because their particles are far apart and have space to move into

Questions

1. What is everything made up from?
2. What are the 3 states of matter?
3. Which state of matter has particles that are very far apart?
4. Which state of matter has particles that are in a regular pattern?
5. What is the movement of particles like in a solid?
6. Which state of matter has particles with the highest energy?
7. Why do solids have a fixed shape and do not flow?
8. Why can solids not be compressed (squashed)?
9. Why do gases completely fill their container?
10. Why can gases be compressed?

Particle Model Homework 2:

Learn the spellings of the following key words and their meanings.

Particle: A very tiny object such as an atom or molecule, too small to be seen with a microscope.

Particle model: A way to think about how substances behave in terms of small, moving particles.

Diffusion: Spreading out of particles in liquids or gases, from high to low concentration.

Gas pressure: A force caused by collisions of particles with the walls of a container.

Density: How much matter there is in a particular volume, or how close the particles are.

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Evaporate: Change from liquid to gas (at the surface of a liquid, at temperatures below boiling point).

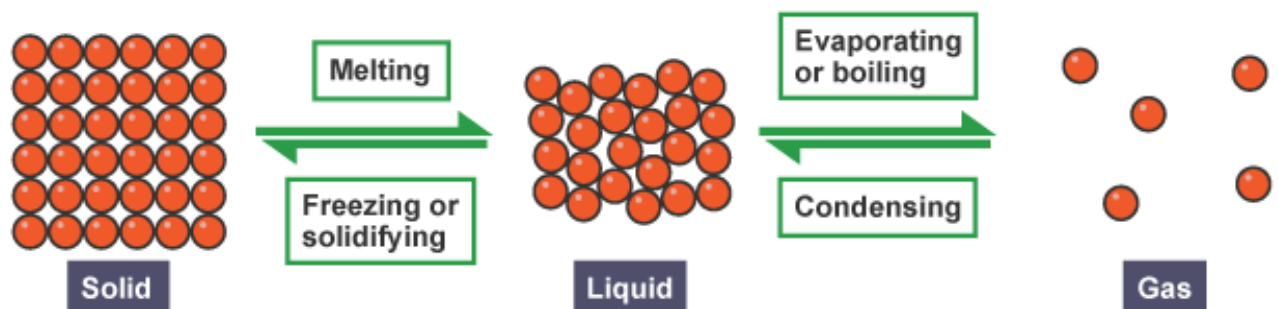
Boil: Change from liquid to a gas (of all the liquid, when the temperature reaches boiling point).

Condense: Change from gas to liquid

Melt: Change from solid to liquid

Freeze: Change from liquid to a solid

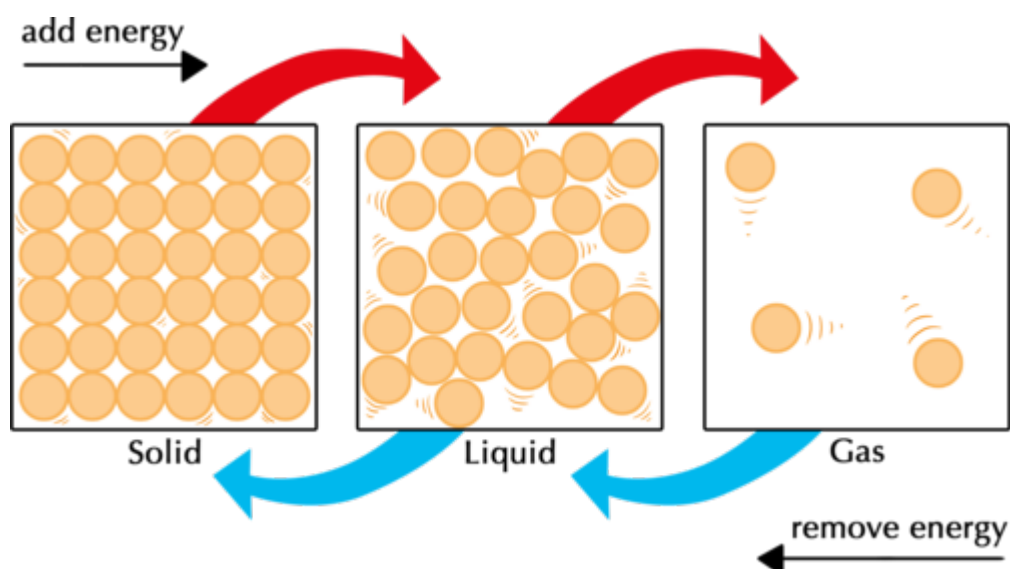
Sublime: Change from a solid directly into a gas.



You will have a short test on this revision in class

Particle Model Homework 3:

Learn the particle arrangement in solids, liquids and gases.



State	Solid	Liquid	Gas
Organisation	Particles in regular rows	Particles randomly arranged	Particles randomly arranged
Spacing	Very close together, touching. Can't be squashed	Very close together, some touching. Can't be squashed	Very spaced out. Can be compressed or squashed together
Energy	Lowest energy		Highest energy
Movement	Vibrate in fixed positions	Can move or slip and slide over each other	Move quickly in all directions

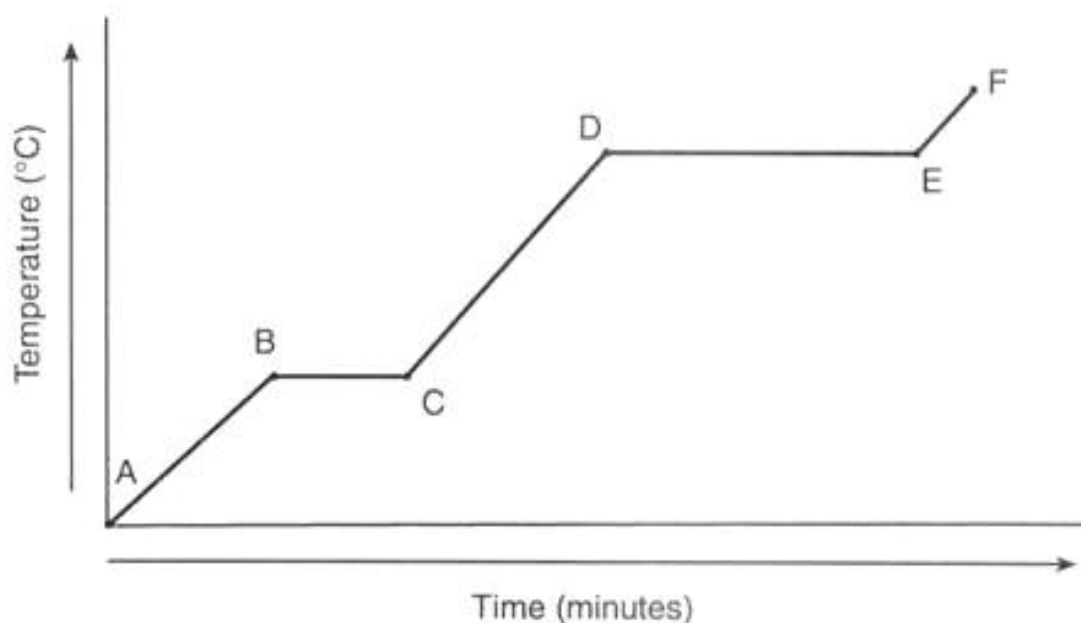
Make sure you can explain the properties of solids, liquids and gases using the particle model.

You will have a short test on this revision in class

Particle Model Homework 4:

Use your knowledge organiser to make sure you know how to interpret heating and cooling curves, and use melting and boiling point data to predict the state of matter at any given temperature.

Use the graph answer the questions below



Between which **2 letters** on the graph...

Example - the substance is a liquid which is getting warmer between... C and D

1. The substance is melting between...
2. The substance is a gas which is getting warmer between...
3. The substance is a solid which is getting warmer between...
4. The substance is boiling between...

5. What name is given to the heat or energy being supplied to a substance to separate the particles as it changes state (You may need to research this!!)

Use the table below to help you answer the following questions

Element	Melting point (°C)	Boiling point (°C)
Copper	1083	2567
Magnesium	650	1107
Oxygen	-218.4	-183
Carbon	3500	4827
Helium	-272	-268.6
Sulphur	112.8	444.6

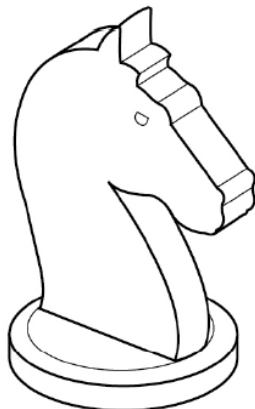
Which substance has:

6. The highest melting point
7. The lowest boiling point
8. The largest temperature range between its melting and boiling points
9. Which substances would be solids at room temperature (25 °C)
10. Which substance would be a liquid at 200 °C

Particle Model Homework 5:

Answer the following question in as much detail as you can.

A student wanted to determine the density of an irregular shaped object – the chess piece shown below



Plan an experiment that would allow the student to determine the density of the object.

Your answer should include:

- What equipment you will use
- What measurements you will need to make
- How you will use your measurements to calculate the density of the object

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(6 marks)