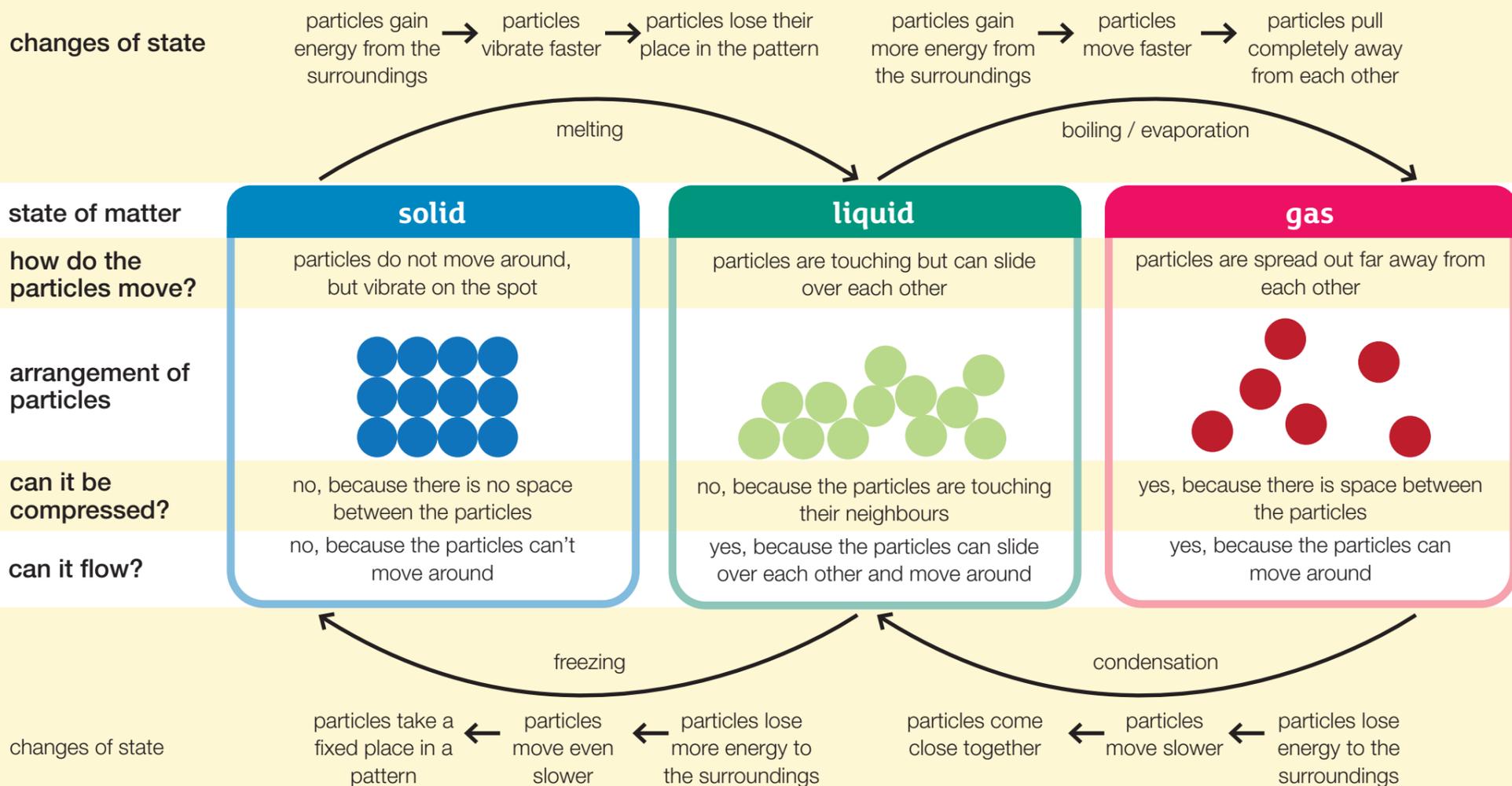


C1

Chapter 1: Particles and their behaviour

Knowledge organiser



Sublimation

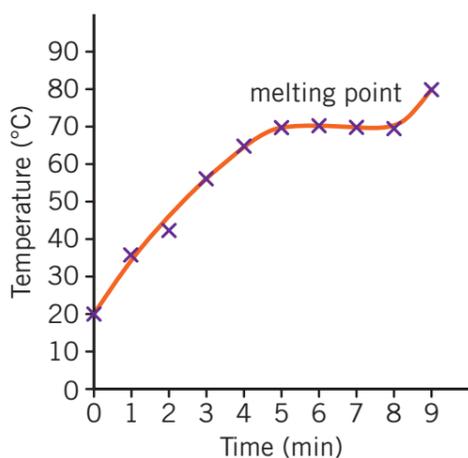
Some substances do not exist as liquids, but instead directly change state from solid to gas in a process called sublimation.

Melting and boiling points

Melting point — the temperature at which a **substance** melts

Boiling point — the temperature at which a substance boils

If you heat a **solid** and plot a graph of temperature against time the melting point will appear as a flat line if the substance is **pure** (has only one type of particle).



Diffusion

Particles move about randomly in liquids and gases and spread out through **mixtures**. This process is called diffusion. How quickly diffusion happens depends upon three variables:

Variable	Effect on diffusion
temperature	diffusion is faster at higher temperatures <i>because</i> particles move faster when hotter
particle size	diffusion is slower with larger, heavier particles
state of matter	diffusion is: <ul style="list-style-type: none"> • fast in gases • slow in liquids • doesn't happen in solids

Gas pressure

Density

Density tells us how heavy something is for its size. You can calculate density using the formula: $\text{density} = \text{mass} / \text{volume}$

Mass is the amount of 'stuff' an object is made of, measured in grams or kilograms.

Volume is the amount of space an object takes up, measured in cm^3 .

Density of a substance depends on:

- the mass of the particles
- how closely together the particles are arranged.

A substance is most dense as a solid, as the particles are closely packed together, and least dense as a gas, as the particles are spread far apart.

Particle model and properties

The properties of a substance depend on:

- 1 the shape and size of its particles
- 2 the arrangement of its particles
- 3 how its particles move
- 4 how strong the forces between its particles are.

Key words

Make sure you can write a definition for these key terms.

boiling boiling point change of state condensation diffusion evaporation freezing gas liquid melting mixture
particle solid state of matter sublimation substance

