

With reference to the particle model explain why solids are usually denser than liquids.

Molecules in a solid are packed much more tightly than in a liquid and are in a fixed position - they do not actively move around, only vibrate.

Explain why changes of state are referred to as physical changes

As only the form/matter of the substance is altered, the actual substance itself isn't changed.

When a system is heated what does the temperature change depend on? (3 things)

- Magnitude of the temperature change
- Mass of the system
- The substance and phase involved

What is the specific heat capacity of a material?

Amount of energy needed to change the temperature of 1kg of a substance by 1 degrees celcius.

What is latent heat?

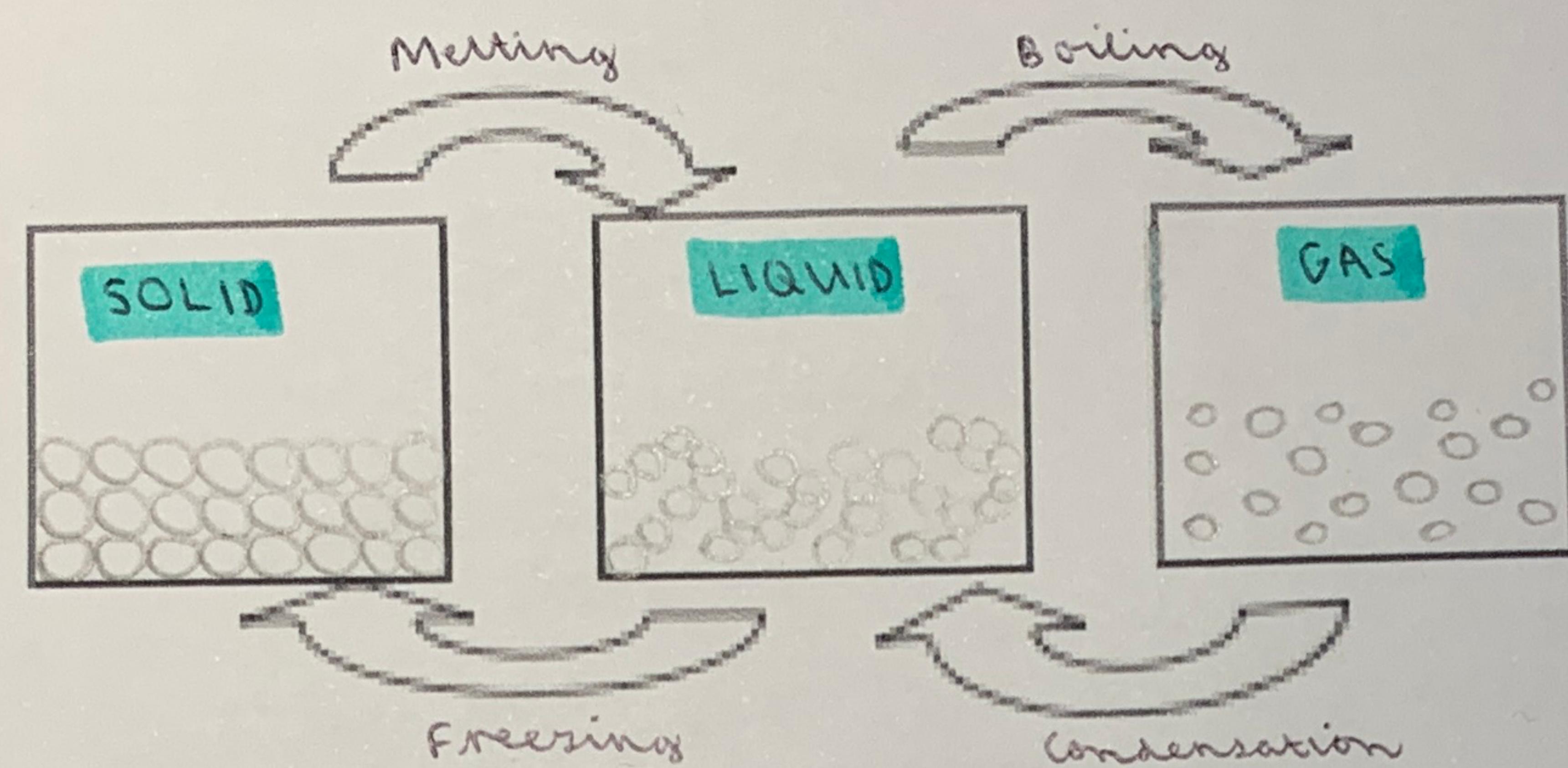
Amount of energy needed to change the state of 1kg of a substance.

What is the specific latent heat of vaporisation?

Latent heat between a liquid and a gas (or vice versa).

Draw a particle model of a solid, liquid and a gas

Label the changes of state



What is meant by the term 'internal energy'?

Total amount of kinetic energy and potential energy of all the particles in the system, increase when a substance melts or boils.

How does heating change the energy stored within a system?

It increases the energy of the particles that make up the system.

### 3.1 – Particle model of matter

Describe the movement of molecules in a gas.

Move rapidly in all directions frequently colliding with each other and the side of the container.

What is the difference between heat and temperature?

Heat is a form of energy and measured in joules.

Temperature is the average kinetic energy of the particles in a substance.

Complete the units

- SHC = J/kg°C
- SLH = J/kg
- Energy = J
- Mass = kg
- Volume = m³
- Pressure = Pa
- Thermal energy = J
- Temperature = °C

What happens to the pressure of a gas if it is heated and the volume remains the same?

Pressure increases.

### EQUATIONS YOU MUST KNOW (and units)

$$\text{Density } (\text{g/cm}^3) = \text{Mass } (\text{g}) \div \text{Volume } (\text{cm}^3)$$

Equations to use:

$$\text{Change in thermal energy} = \text{mass} \times \text{SHC} \times \text{temp change}$$

$$\text{Thermal energy for change of state} = \text{mass} \times \text{SLH}$$

$$\text{For gases: pressure} \times \text{volume} = \text{constant}$$