

AS 90939 v2 Demonstrate understanding of aspects of heat

- temperature - temperature is a measure of the average kinetic energy of the particles making up an object (measured in °C or K)
- 0 K = -273°C (absolute zero – temperature at which all molecular motion ceases). 273 K = 0°C, 373 K = 100°C. To convert K to °C subtract 273; To convert °C to K add 273!
- a temperature change of 1 degree Kelvin (1 K) is the same as a temperature change of 1 degree celcius or centigrade (1°C)
- heat - heat is a measure of the total energy of an object (measured in joules)
- heat energy - thermal energy. It is transferred from one thing to another thing because of the temperature difference between them. Direction of energy flow is always from a warmer to a cooler thing. Heat won't transfer between objects at the same temperature.
- latent heat - is the term used to describe energy which causes a change of state/phase without change of temperature. During a phase change, the heat energy goes into the work of breaking bonds and separating molecules, rather than increasing the temperature.
- phase changes (solid to liquid to gas and vice versa)
- the specific latent heat of a substance (L) is the quantity of energy needed to change the state of 1 kg of a substance without a change in temperature.



<p>The specific latent heat of fusion is the amount of heat required to convert 1 kg of a solid into the liquid without a change in temperature.</p>	<p>The specific latent heat of vaporisation is the amount of heat required to convert 1kg of a liquid into the vapour without a change in temperature.</p>

- the specific latent heat of fusion of ice at 0°C, for example, is 334000 J kg⁻¹. This means that to convert 1 kg of ice at 0°C to 1 kg of water at 0°C, 334000 J of heat must be absorbed by the ice. Conversely, when 1 kg of water at 0°C freezes to give 1 kg of ice at 0°C, 334000 J of heat will be released to the surroundings.
- heat transfer mechanisms
 - conduction
 - convection
 - radiation
- efficiency of heating
- insulation
- thermal expansion
- relationships $P = E/t$, $Q = mc\Delta T$ and $Q = mL$