CHAPTER : 5

HEAT

CLASS :: 10TH

CHAPTER :: 5

SCIENCE AND TECHNOLOGY

Part : II

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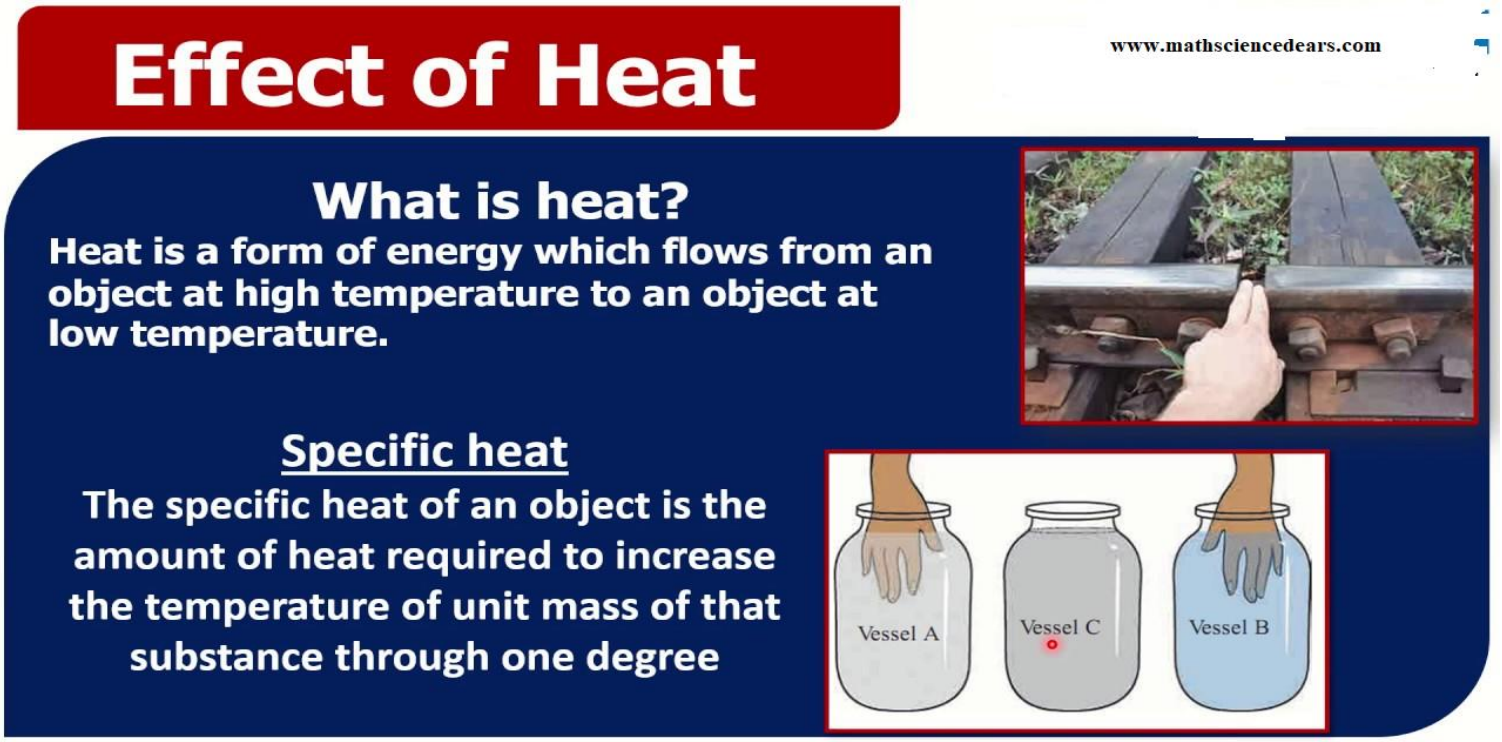
Difference Between heat and temperature

Heat	Temperature
Heat is a form of energy which flows from an object at high temperature to an object at low temperature.	Temperature is the degree of hotness or coldness of an object.
Unit is Jules	Unit is Kelvin
Device used to measure: Calorimeter	Device used to measure: Thermometer
Symbol: Q	Symbol: T
Total kinetic and potential energy contained by molecules in an object	Average kinetic energy of molecules in a substance

Effects of heat are :

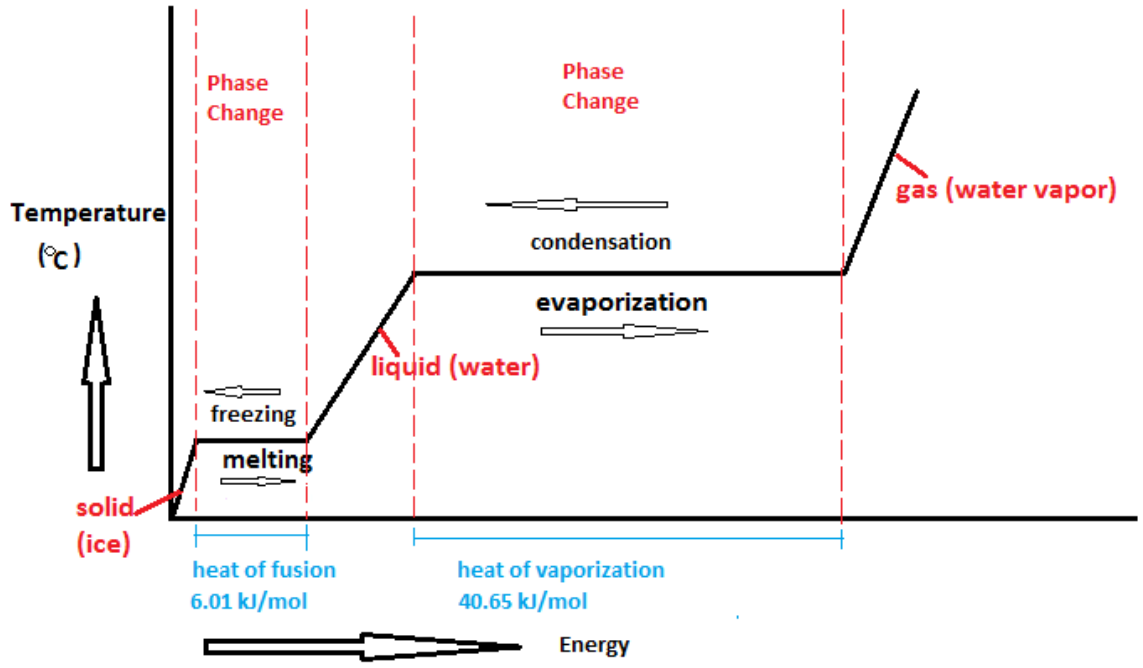
a. It changes the state of matter
b. It changes the temperature of an object.
c. It changes the solubility of a substance.
d. It changes the size of an object.
e. It changes the color of the body.
f. It changes the volume of the body

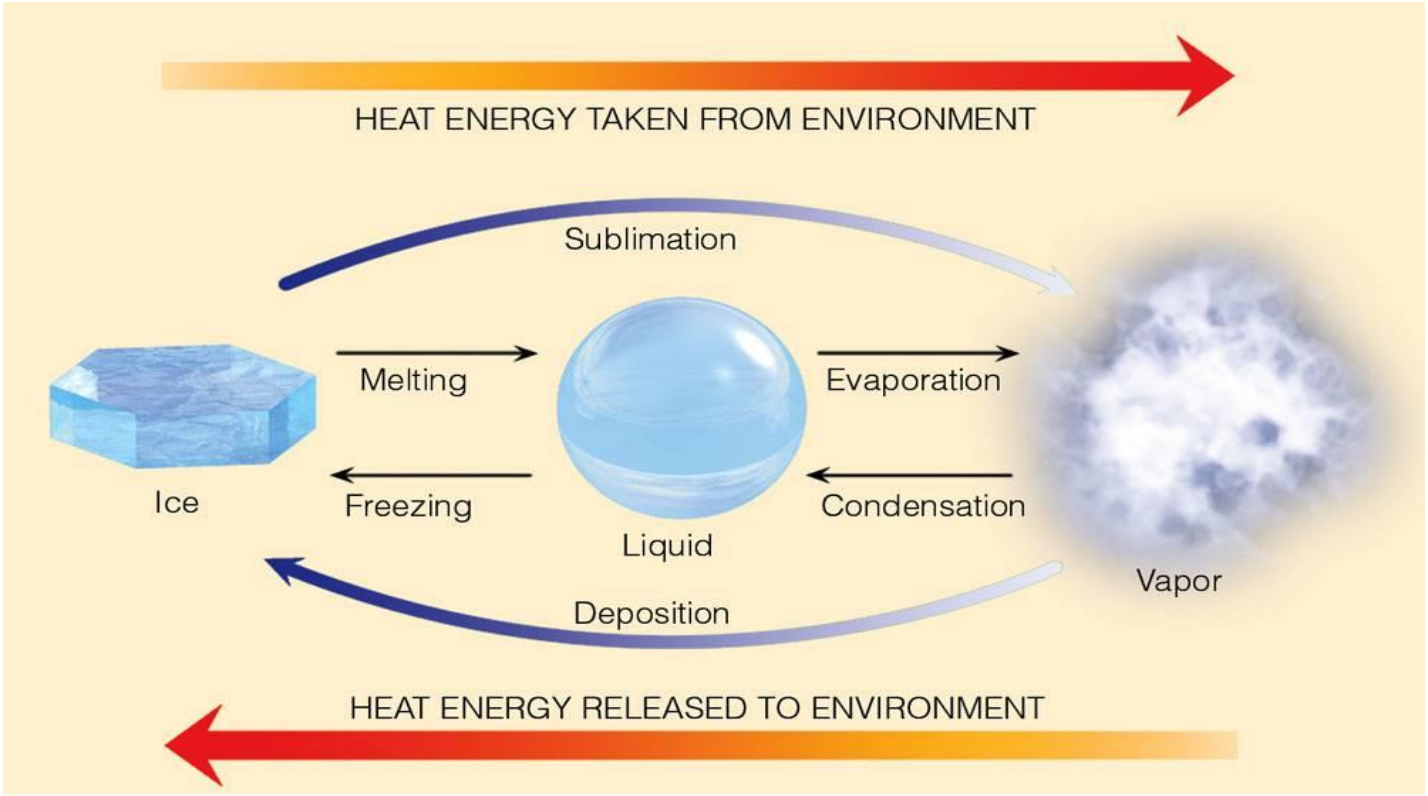


Latent heat

What is latent heat ?

Latent heat is defined as the heat absorbed or released when a substance changes its physical state completely at constant temperature

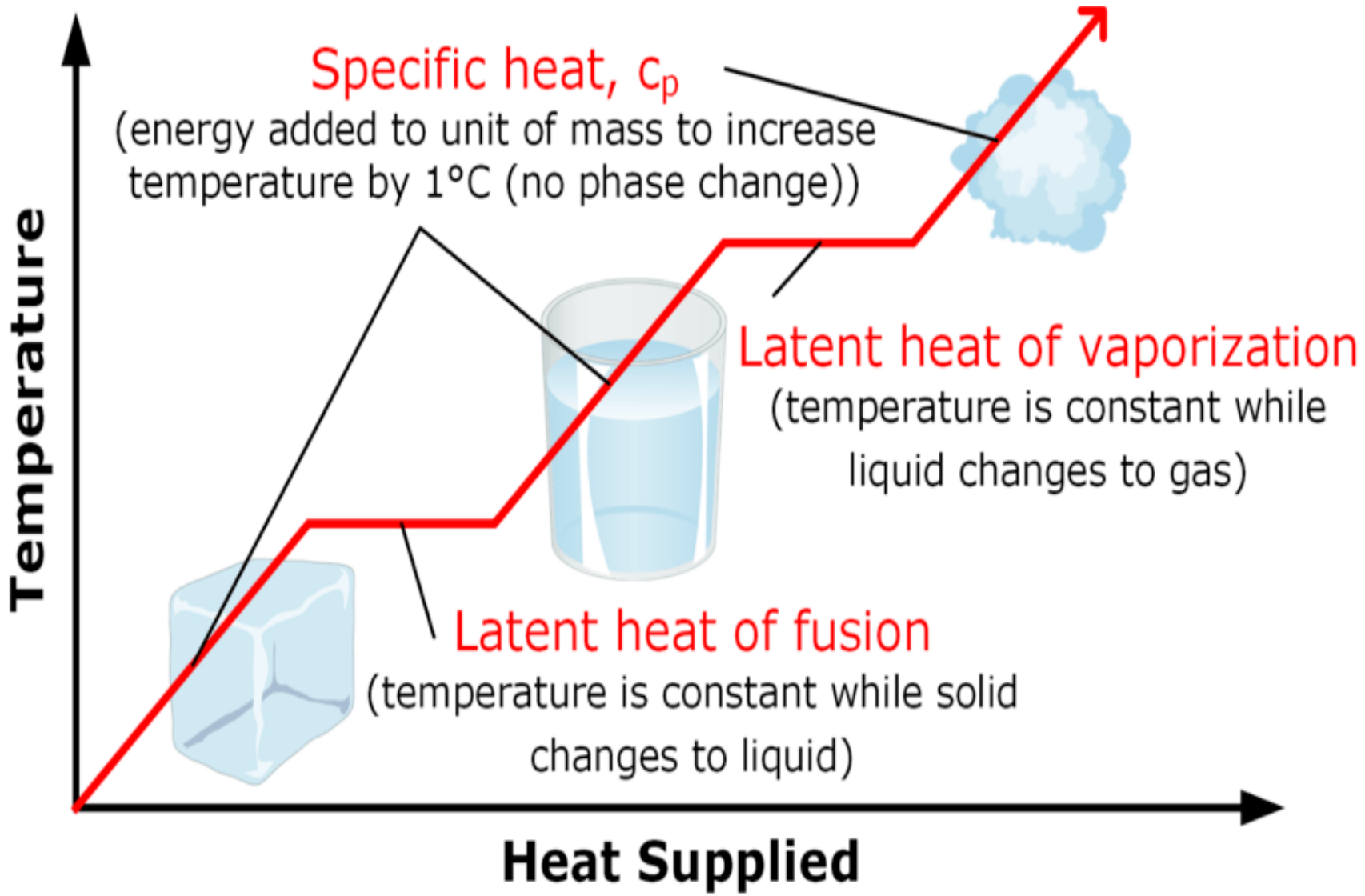




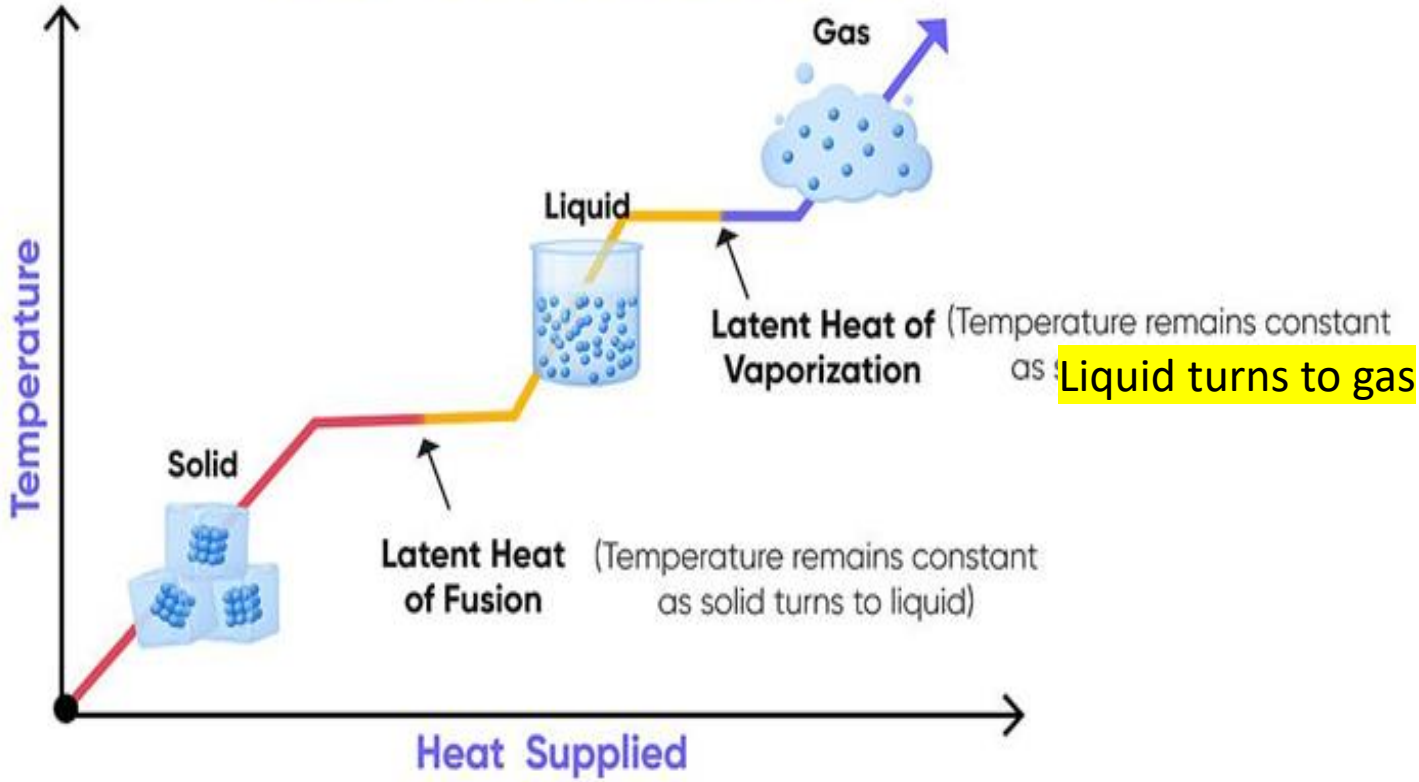
- HEAT
VAPOR TO LIQUID (CONDENSATION)

Boiling water temperature = Water vapor temperature= 212° F or 100° C

+ HEAT
FROM LIQUID TO VAPOR (EVAPORATION)


Specific heat, c_p
(energy added to unit of mass to increase temperature by 1°C (no phase change))
Latent heat of vaporization
(temperature is constant while liquid changes to gas)
Latent heat of fusion
(temperature is constant while solid changes to liquid)
Temperature
Heat Supplied

LATENT HEAT OF FUSION AND VAPORISATION



Liquid turns to gas

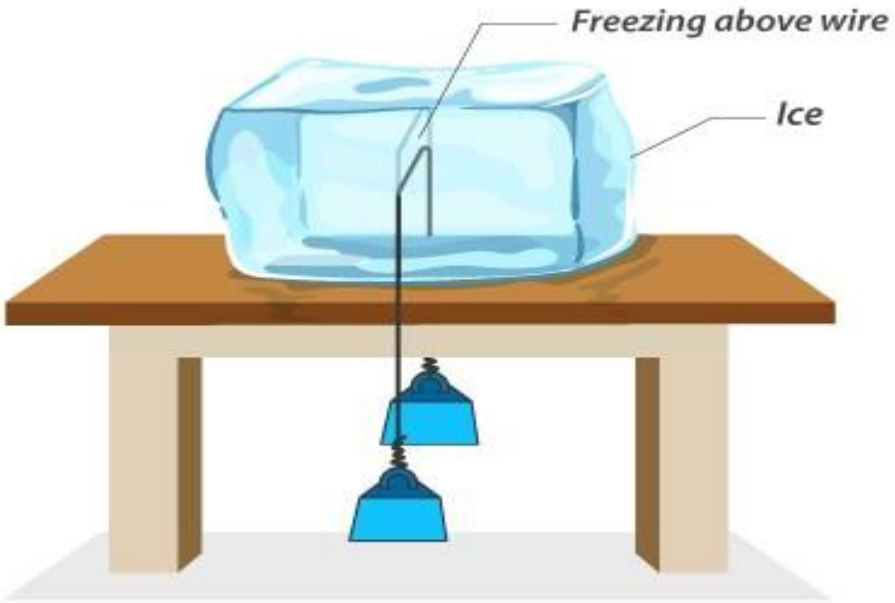
What is specific latent heat?

- Specific latent heat, L, of a substance defined as the amount of heat required to changed the phase of 1 kg of the substance at a constant temperature.
- It can be calculated as;

$$L = Q/m$$

Regelation

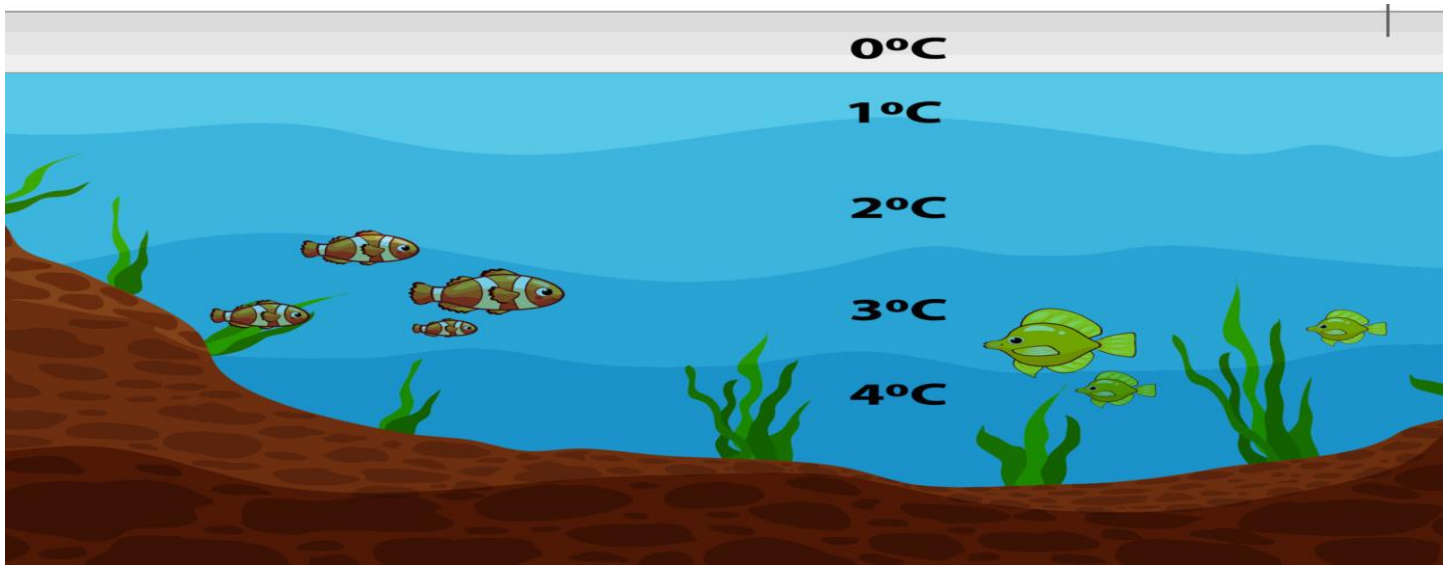
Regelation is basically the phenomenon where the ice melts to the water below 0°C when pressure is applied and it refreezes back to ice when the pressure is removed.



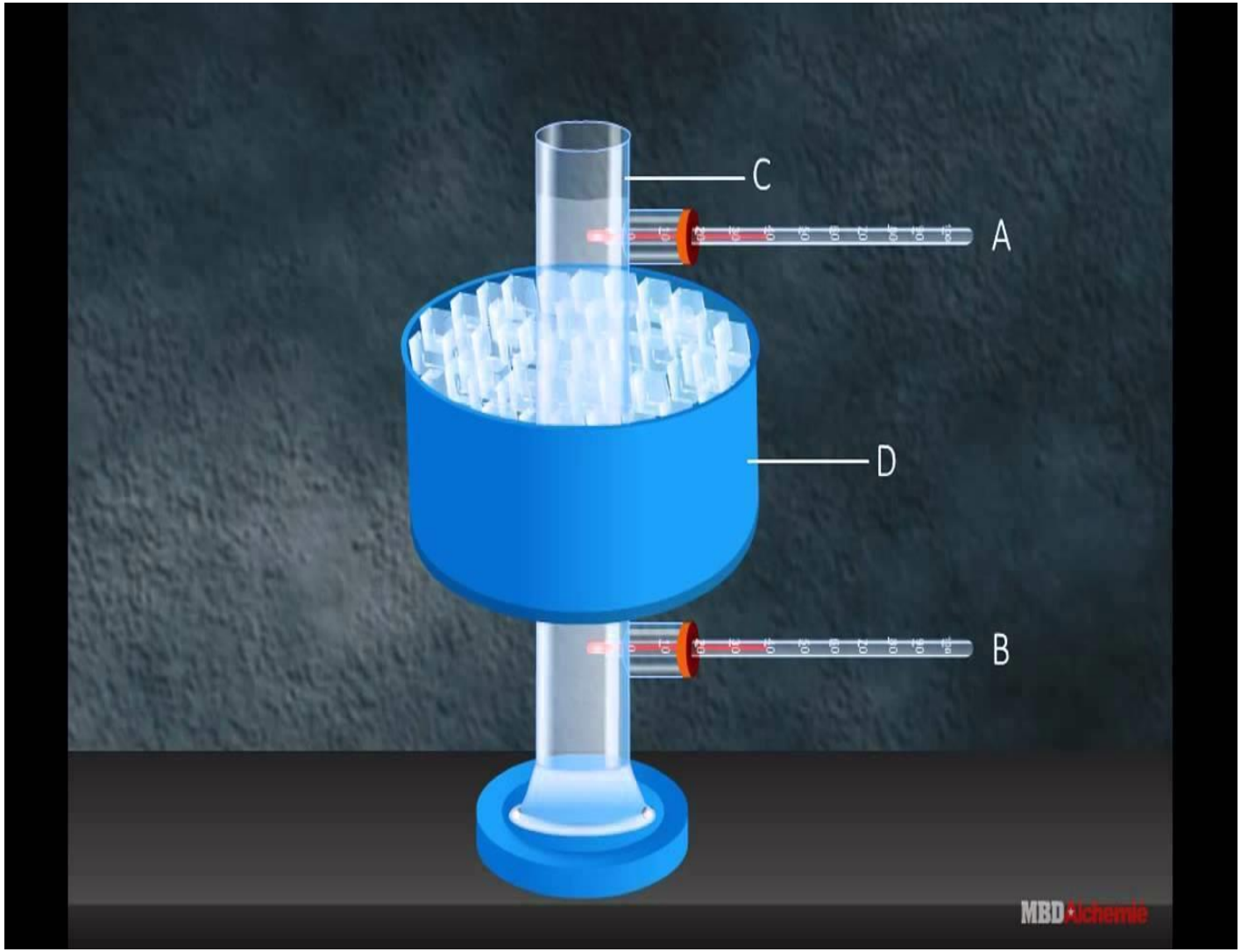
Explanation for Anomalous behaviour of water

ANOMALOUS EXPANSION OF WATER

The anomalous expansion of water is defined as the property of water that causes it to expand rather than contract when the temperature changes from 4°C to 0°C, causing it to become less dense.



HOPES APPARATUS



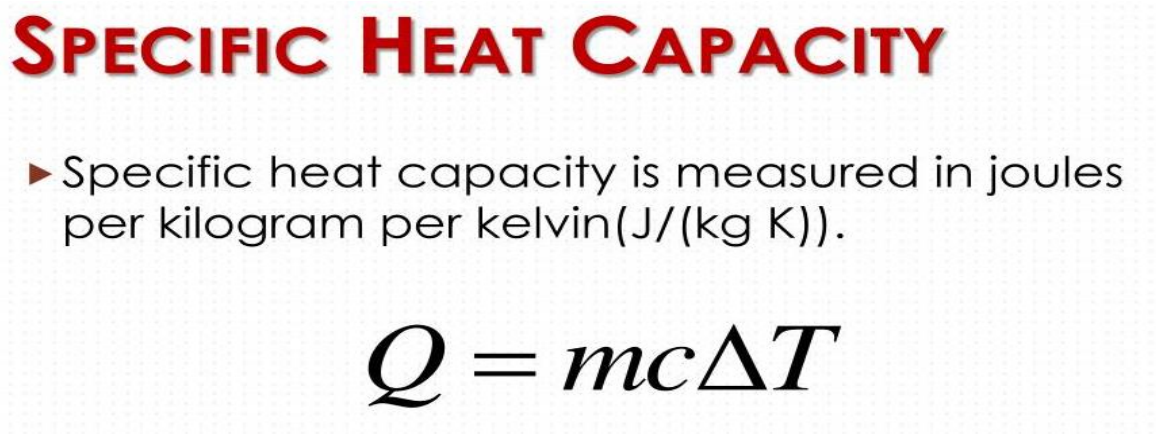
Main Difference – Dew Point vs. Humidity

Humidity and **Dew Point** are both units used to express the amount of water vapour present in the air.

The **main difference** between dew point and humidity is that **humidity measures the amount of water vapour in the atmosphere** whereas **dew point measures the temperature at which dew can begin to form**.

Specific Heat Capacity (symbol: c) **Definition**

Specific heat capacity is the amount of heat energy required to raise the temperature of a substance per unit of mass.



where C is heat capacity, Q is energy (usually expressed in joules), and ΔT is the change in temperature

Material	Specific Heat (J/g°C)	Heat Capacity (J/°C for 100 g)
gold	0.129	12.9
mercury	0.140	14.0
copper	0.385	38.5
iron	0.450	45.0
salt (Nacl)	0.864	86.4
aluminum	0.902	90.2
air	1.01	101
ice	2.03	203
water	4.179	417.9

THANK YOU

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