

HEAT

Heat :

The energy transferred from one body to another due to a temperature difference between them is called heat.

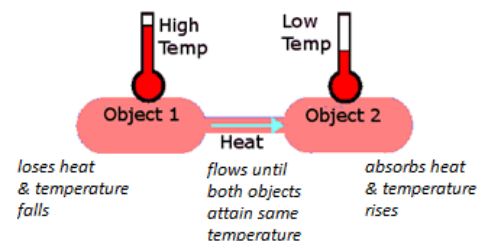
- ❖ always flow from a body at higher temperature to a body at a lower temperature .

Sources of Heat :

- ❖ fire
 - Inflammable substance – easily catch fire.
ex: LPG, Paper
 - Non- flammable substance - fire resistant
ex: sand, water
- ❖ sun
- ❖ electricity

Temperature :

It is the degree of hotness or coldness of the body .



Measurement of Temperature :

Units : $^{\circ}\text{C}$, $^{\circ}\text{F}$ and K

SI unit : kelvin (K)

Instrument used : Thermometer

Thermometer :

Principle : A given length of liquid (mercury) column rises with the rise in temperature.

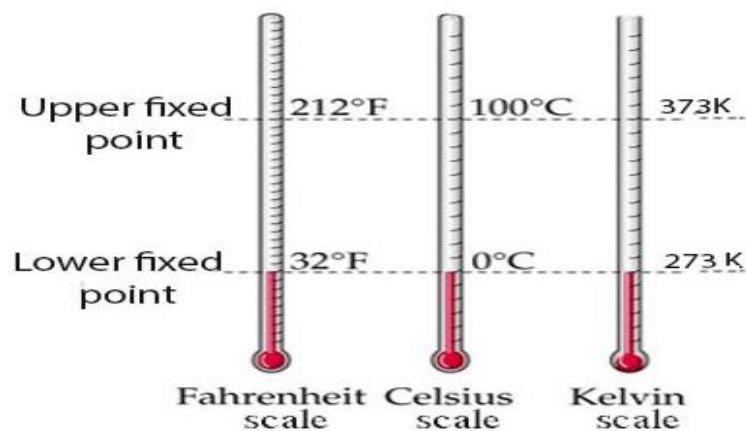
Qualities of good thermometer:

- Thermometer bulb – thin walled
- Stem – made of thick glass
- Narrow capillary bore
- Liquid used
 - should expand uniformly
 - low freezing point
 - high boiling point
 - non volatile
 - low specific heat capacity
 - available in pure state
 - not stick to glass

Thermometric Liquids :

- Mercury
- Alcohol

Scales of Temperature :



Conversion between scales :

Celsius to kelvin :

$$K = ^{\circ}\text{C} + 273$$

Fahrenheit to Celsius :

$$F = \frac{9}{5}C + 32$$

Celsius to Fahrenheit

$$C = \frac{5}{9}(F - 32)$$

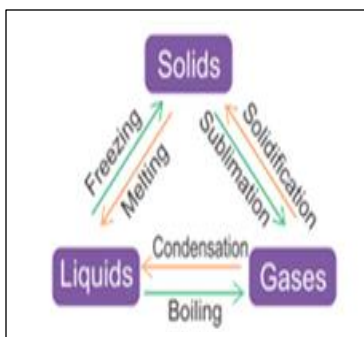
Relationship:

$$\frac{C}{100} = \frac{F - 32}{180} = \frac{K - 273}{100}$$

- $0^{\circ}\text{C} = 32^{\circ}\text{F}$
- $100^{\circ}\text{C} = 212^{\circ}\text{F}$
- $98.6^{\circ}\text{F} = 37^{\circ}\text{C}$

Effects of Heat

- **Change in temperature of the body**
 - When heated temperature rises
- **Change in the shape of the body**
 - Thermal expansion
- **Change in state of matter**
 - **Fusion or melting** – absorption of heat
 - **Freezing** - release of heat
 - **Vaporization or Boiling** – absorption of heat
 - **Condensation** – release of heat
 - **Sublimation** – ex: camphor, naphthalene, iodine etc
 - **Solidification** – ex: CO₂ into dry ice



Expansion :

- Substances expands on heating and contracts on cooling.
- But, Water on heating from 0°C to 4°C - contracts and on heating above 4°C - expands
- Gases expands the most and solids expand the least