HEAT

Heat :

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

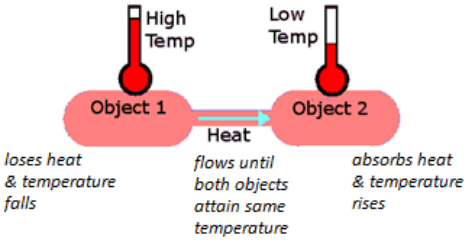
- always flow from a body at higher temperature to a body at a lower temperature .

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 : ^{0}C , ^{0}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.

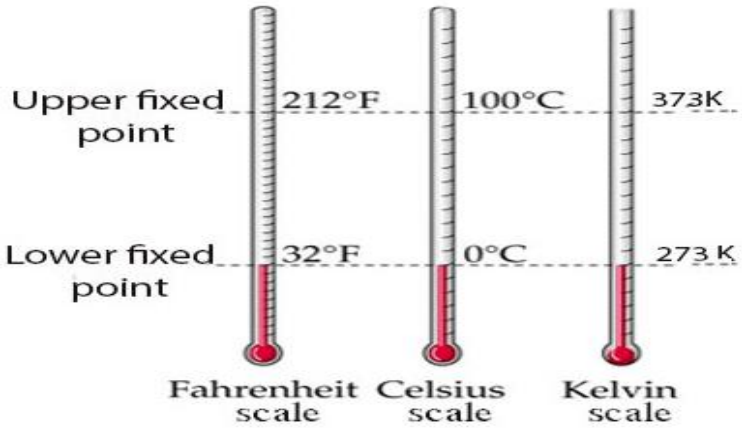
Qualities of good thermometer:

- 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 = ^{0}C + 273

Fahrenheit to Celsius :

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

Celsius to Fahrenheit

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

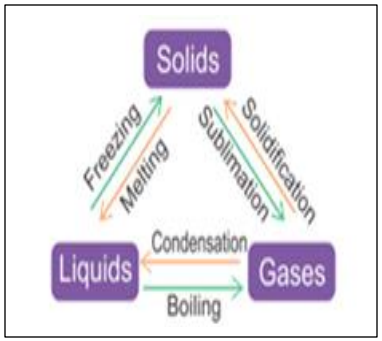
Relationship:

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

- 0^0 C = 32^0 F
- 100^0 C = 212^0 F
- 98.6^0 F = 37^0 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: CO_2 into dry ice

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