

## Temperature

Use a thermometer to measure temperature precisely.  
 • 2 scales commonly used.

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

$$^{\circ}\text{F} = \frac{9}{5} (^{\circ}\text{C}) + 32$$

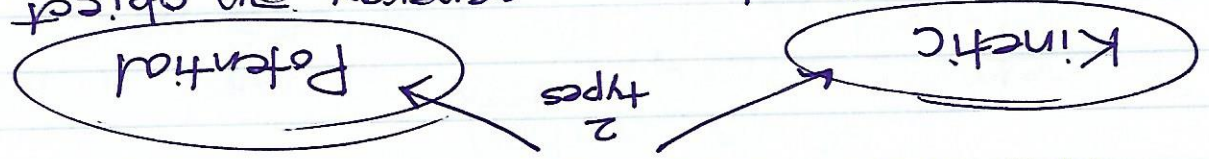
|  |                                      |  |
|--|--------------------------------------|--|
| <u><math>^{\circ}\text{F}</math></u>     | <u><math>^{\circ}\text{C}</math></u> |  |
| Boiling Pt. Water 212 $^{\circ}\text{F}$ | 100 $^{\circ}\text{C}$               |  |
| Human Body Temp. 98.6 $^{\circ}\text{F}$ | 37 $^{\circ}\text{C}$                |  |
| Room Temp. 72 $^{\circ}\text{F}$         | 22.2 $^{\circ}\text{C}$              |  |
| Freezing Pt. Water 32 $^{\circ}\text{F}$ | 0 $^{\circ}\text{C}$                 |  |

• Thermometer: clear tube filled with a liquid that expands when heated & contracts when cooled.

## Forms of Energy

• Law of Conservation of Energy: (energy) can be transferred from one object or system to another, it cannot be created or destroyed.

• Mechanical Energy: energy an object has because of its motion or position.



• energy an object has because its

- moving
- speed,  $\downarrow$  K.E.
- mass,  $\downarrow$  K.E.

• energy an object has because of its

- position or shape
- higher position,  $\downarrow$  P.E.

## Other Forms of Energy

- Thermal Energy : (sometimes called heat energy) is the energy related to the temperature of a substance
- Light Energy : energy carried by (light and other) electromagnetic waves
- Sound's Energy : energy carried by sound waves
- Electrical Energy : energy produced by electric charges
- Chemical Energy : energy stored in chemical bonds
- Nuclear Energy : energy contained in the nuclei of atoms

## Thermal Energy

- All matter is made of particles - called atoms & molecules
- These particles are in constant motion. - vibrate, rotate or move randomly
- Because THESE PARTICLES ARE IN MOTION → THEY HAVE KINETIC ENERGY - K.E. (kinetic energy) energy an object or substance has because of its motion
- Thermal Energy → TOTAL amount of K.E. contained in all the particles in the substance.
- ↓ K.E. - ↓ Thermal Energy
- ↓ # particles - ↓ Thermal Energy

## Temperature vs. Heat

Temperature: measure of the AVERAGE kinetic energy of the particles in a substance.

- NOT affected by # of particles

• Heat: transfer of thermal energy between substances @ different temperatures

- energy always transferred from warmer substance to cooler substance