*Kinetic Molecular Theory (KMT)

*KMT states:
  *All substances are made of particles in constant motion

*<u>Three Types of Motion:</u>
  *Translational – from one location to another
  *Rotational – rotating on an axis
  *Vibrational – stretching/shrinking of bonds, shaking, bending

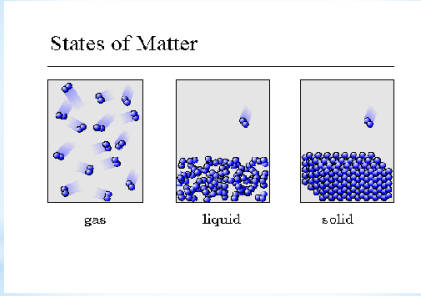
STATES OF MATTER

Amount and type of motion is different for different states of matter:

* **Solid** – very little particle motion
  (no translational, little rotational, little vibrational)
  strong interparticle attractions

* **Liquid** – some particle motion
  (some translational, rotational and vibrational)
  some interparticle attractions

* **Gas** – lots of particle motion
  (lots translational, rotational, vibrational)
  weak (virtually no) interparticle attractions



*Phase changes occur when energy is added/removed because it increases/decreases the amount of interparticle attractions

*Brownian motion:
  constant, random straight-line movement of particles

*<u>Phase</u>: Depends on the strength of the interparticle forces (which is a type of potential energy - PE)

PHASE CHANGES

*Endothermic
*Energy absorbed
*Interparticle forces decrease

SOLID → LIQUID → GAS

*Exothermic
*Energy released
*Interparticle forces increase

SOLID ← LIQUID ← GAS

During phase changes…

* **…the energy involved changes the potential energy stored in the attractions between molecules**

* Therefore…
  - PE changes occur during phase changes
  - KE does not change
    - Therefore, no temp change during phase changes
    - Remember…Temperature = measure of average KE of particles