

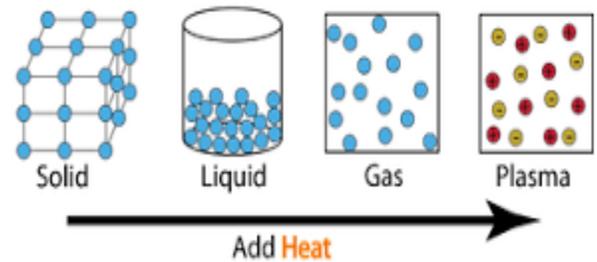
Unit 2: ENERGYEnergy can NOT be created or destroyed it can only change form

Fall 2018 Aug 30 – Sept 20

1. I can discuss the particle arrangement of Solid, Liquids & Gases as influenced by the Kinetic ENERGY of the Particles. (SPS 5a)

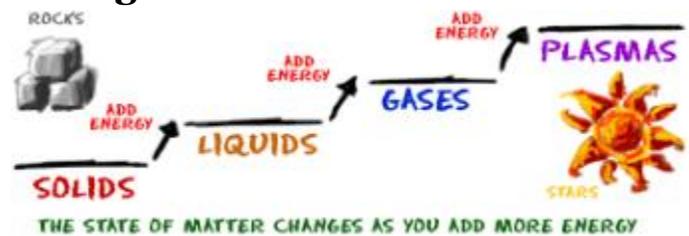
a. Temperature = Average Kinetic ENERGY of the particles.

- Understand the specifics of each phase of matter, and why they exist the way they do.
- Solids: Crystalline, Polycrystalline, Amorphous
- Liquids: Surface Tension and Intermolecular Forces
- Gases: Random, Chaotic, Disperse to fill their container/area, unable to conduct electricity.
- Plasma: Particles of gas that have an increased amount of ENERGY resulting in a charge; therefore, conduct electricity.

**2. I can Develop, Analyze & Interpret Heating Curves focused on ENERGY**

a. A heating Curve has two distinct portions defined by how the increase in Energy is affecting the matter.

- The sloped portions of the curve represent a change in Average Kinetic ENERGY = Δ in Temperature
- The plateaus of the curve represent breaking or forming intermolecular forces of attraction.

**3. I understand the mathematical and application concepts of Specific Heat “Heat Capacity” of a substance.**

a. Analyze specific heat data to select the most appropriate materials for an intended purpose.

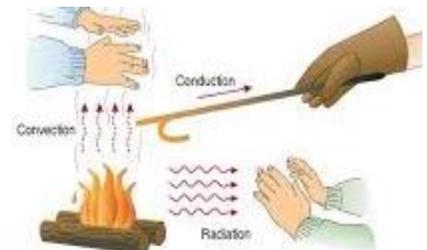
- Lower Specific Heat Value = Absorbs or Releases Heat Quickly/Easy to Δ Temperature
- Higher Specific Heat Value = Absorbs or Releases Heat Slowly/ Harder to Δ Temperature

b. I can use the following formula to solve for Amount of ENERGY, Amount of Mass, Specific Heat of a Substance, Change in Temperature, or Initial/Final Temperature.

$$Q = (m)(c)(\Delta T) \quad \text{or} \quad Q = mc(T_F - T_I)$$

4. I understand how heat can transfer or move: Conduction, Convection & Radiation

- a. Conduction: Transfer of heat (ENERGY) From atom to atom
- b. Convection: Transfer of heat (ENERGY) throughout a fluid (Air or Liquid)
 - Convection current = hot fluid rises & cold fluid sinks, represented by a circular pattern.
- c. Radiation: Transfer of heat (ENERGY) in the form of waves.

**5. I understand the Law of Conservation of ENERGY.**

a. Be Familiar with the following types of ENERGY and pathways in which one form can change to another.

- Mechanical, Electrical, Electromagnetic, Kinetic, Potential (Gravitational, Elastic, Chemical), Thermal, Solar (Radiant), Light, Sound, Nuclear (What holds the Nucleus of Atom together)

