Notes for Transfer of Heat

- **Thermal Energy is the amount of energy in a substance based on particle motion.**
- **Temperature is a measurement of thermal energy. Substances with high temperatures have more particle motion and more thermal energy.**
- **Heat is the flow of thermal energy from hot substances to cold substances.**
- **Hotter substances – atoms moving faster – more chances of collision for atoms to pass on energy.**
- **When thermal energy is transferred by atoms colliding, the faster moving particles slow down and the slower moving particles speed up, until equilibrium is reached.**

Methods of Heat Transfer

Radiation – Uses electromagnetic waves and does not require atoms.

- **When light waves touch objects, they are turned into infrared waves, which have longer wavelengths.**
- **The longer infrared wavelengths get trapped by atmospheric gases and warm up the atmosphere. (Greenhouse Effect)**
- **Black objects absorb more light (get hotter)**
- **White objects reflect more light (stay cooler)**

Conduction – when atoms collide and transfer thermal energy

- **Once light energy strikes the ground through radiation, thermal energy is transferred through conduction.**
- **Conductors – transfer heat easily (metals)**
- **Insulators – do not transfer heat easily (wood, rubber, plastic)**

<u>Convection</u> – When fluids (air and liquids) rise and sink as temperature changes result in changes in density.

- **Hot fluids – atoms spread out – less dense – rise**
- **Cold fluids – atoms condense – more dense – sink**

- **Convection Currents - Continual rising of hot fluids and sinking of cold fluids.**