Thermal Energy

- The total energy (kinetic+potential) of the atoms and molecules of a substance
- Amount depends on mass, temperature and type of substance
- "Q" = mass x specific heat capacity x temperature (in Kelvin)

Temperature

- A measurement of the average energy of the molecules in a substance

	Kelvin	Celsius	Fahrenheit
H2O Boils or Condenses *	373 K	100°C	212°F
Body Temp	306.8 K	36.8°C	98.2°F
H_2O Melts or Freezes *	273 K	0°C	32°F
Absolute Zero	0 K	-273°C	-459°F

* at normal atmospheric pressure at sea level

Heat Energy

- The movement or transfer of thermal energy from one substance to another
- Always in direction from warmer to colder
- Heat and Thermal Energy are measured in Joules (same for all forms of energy)

Conduction

- Heat transfer by contact
- Some materials conduct well and are conductors
- Some materials do not conduct well and are insulators

Convection

- Heat transfer through a fluid
- A fluid is anything that flows from one place to another (gas, liquid or solid)
- The fluid naturally carries heat energy from warmer to colder (convection currents)
- Can be manipulated by pressure to carry heat from colder to warmer (refrigerator)

Radiation

- Heat transfer by electromagnetic waves
- All objects emit thermal radiation as a form of invisible light
- This is how the sun heats the earth and how some nocturnal animals find food