FORMULAS

ELECTRICITY:

Power (**Watts**) = Energy (**Joules**)/Time (**sec**)
Power(**Watts**) = Current(**Amps**) * Voltage (**Volts**)
Voltage (**Volts**) = Current (**Amps**) * Resistance (**Ohms**)
Voltage (**Volts**) = Energy (**Joules**)/Charge (**Coloumbs**)
-1 **Coloumb of Charge = 6.2 * 10^{18} electrons**
Electric Force is proportional to Charges/Dis^2
Electric Field is Force/Charge
Series Circuits: Rtot = R1 + R2 …..
Parallel Circuits: V1=V2, 1/Rtot = 1/R1 + 1/R2 ……

$D= ViT + 1/2\ AT^2$
$Vf^2= Vi^2 + 2AD$ $A=\Delta V\ /\Delta T$

CONSERVATION OF ENERGY:

$\Delta Q + KE + PE + \Delta W = \Delta Q + KE + PE + \Delta W$

$KE= ½\ M\ V^2$ KE= Kinetic Energy in **Joules**
$PE= M*g*h$, $g= 9.8\ m/sec^2$ PE =Potential Energy in **Joules**
•ΔWork (**Joules**)= Force (N) * ΔDistance (m) = Pressure (Pa) * Δ Volume (meters cubed)

HEAT ΔQ
Two substances in contact: ΔQ=ΔQ for thermal equilibrium
-Increasing/decreasing temperature without changing phase:
(C is the specific heat of a substance changing temperature)
$\Delta Q=m*C*\Delta T$

-Changing phase:
$\Delta Q=m*Hf$ for melting/freezing, $\Delta Q=m*Hv$ for vaporizing/condensing
(Hf and Hv are the heat of fusion and the heat of vaporization for a substance changing phase)

Thermodynamics Law 1 Conservation of Energy
Heat Added = Internal Energy(Temp) + Work done
ΔQ = ΔU + ΔWork

Efficiency = (Thot-Tcold)/Thot (law 2)
T=Temperature in **Kelvin**

Entropy or Order to Chaos, 2nd law

WATER: ICE: C=2090 **J/Kg °K**, Liquid C=4187 J/Kg °K, STEAM C=2020 J/Kg °K
WATER: Hf=335, 000 J/kg Hv=2,260,000 J/Kg

Person:C= 3470 J/Kg °K, C for liquid or gas person=1674 J/Kg °K
boils at 1700 degrees Celsius
Hf=277633 J/Kg, Hv=1872988 J/Kg,

Other conversions:
Density of Water= 1 gram per milliliter=1000 **kilograms per cubic meter**
1000 grams= 1 kilogram, 1 kilogram=.001 grams
degrees Celsius= degrees Kelvin- 273
1 Kilocalorie= 1 Calorie = 1000 calories = 4187 Joules
1 Kilowatt Hour = 861 Calories