LINEAR MOTION

velocity, $v = \frac{\Delta x}{t}$

acceleration, $a = \frac{\Delta v}{t}$

Newton's 2nd Law,
$F_{NET} = m \cdot a$

Constant Acceleration
$v_f = v_i + at$
$\Delta x = v_i t + \frac{1}{2} a t^2$

Work, $W = F \cdot d$

Power, $P = \frac{W}{t}$

Kinetic Energy, $K = \frac{1}{2} m v^2$

Potential Energy, $U = mgh$

Momentum, $p = mv$

Impulse, $\Delta p = F_{AVG} \cdot t$

ROTATIONAL MOTION

angular velocity, $\omega = \frac{\Delta \theta}{t}$

angular acceleration, $\alpha = \frac{\Delta \omega}{t}$

torque, $T = F \cdot l$

rotational inertia, I

Newton's 2nd Law
$T_{NET} = I \cdot \alpha$

constant angular acceleration
$\omega_f = \omega_i + \alpha t$
$\Delta \theta = \omega_i t + \frac{1}{2} \alpha t^2$

Angular Momentum, $L = I\omega$

Linear velocity to angular velocity
$v = \omega \cdot r$

MISCELLANEOUS

weight, $F_g = mg$

Newton's Law of Universal Gravitation
$F_g = \frac{G m_1 m_2}{r^2}$, $G = 6.67 \cdot 10^{-11} \frac{N m^2}{kg^2}$

Hooke's Law (spring force), $F = kx$

Spring Potential Energy, $U_s = \frac{1}{2} k x^2$

centripetal acceleration $a_c = \frac{v^2}{r}$

centripetal force, $F_c = m a_c = \frac{m v^2}{r}$

Pressure $= \frac{\text{Force}}{\text{Area}}$

ELECTRICITY

Force due to a charge in an electric field
$F = q \cdot E$

Electric field caused by a source charge q_0
$E = \frac{k q_0}{d^2}$, $k = 9 \times 10^9 \frac{N m^2}{C^2}$

Electric potential energy
$U_e = q \cdot E \cdot d$ [Joules]

Electric potential, [Volts]
$V = \frac{U_e}{q} = E \cdot d$

CIRCUITS

Ohm's Law
$V = I \cdot R$

Electric Power, $P = I \cdot V$
$P = I^2 R$

Resistors in series
$R = R_1 + R_2$

Resistors in parallel
$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$

HEAT and TEMPERATURE

Celcius to Fahrenheit Conversion
$T_F = \frac{9}{5} T_C + 32$

Fahrenheit to Celcius Conversion
$T_C = \frac{5}{9}(T_F - 32)$

Heat to change temperature
$Q = m C_p \Delta T_c$ $C_p \rightarrow$ specific heat capacity

Heat to change phase (solid-liquid-gas)
(Latent Heat)
$Q = m L_f$ $L_f \rightarrow$ latent heat of fusion (ice to water)

WAVES + SOUND

frequency and period
$f = \frac{1}{T}$ + $T = \frac{1}{f}$

speed of waves
$v = f \cdot \lambda$

speed of waves on a string
$v = \sqrt{\frac{F}{\mu}}$ $\mu = \frac{m}{L}$

standing waves on a string

	wavelength	frequency
fundamental	$\lambda = 2L$	$f = \frac{v}{2L}$
1st overtone	$\lambda = \frac{2L}{2}$	$f = \frac{2v}{2L}$
2nd overtone	$\lambda = \frac{2L}{3}$	$f = \frac{3v}{2L}$