SCIENCE *physics laws & formulas*

Mass Density

mass density = $\frac{\text{mass}}{\text{volume}}$

Speed

average speed = $\frac{\text{distance covered}}{\text{elapsed time}}$

Acceleration

$a = \frac{\Delta v}{\Delta t}$ or $\frac{v_F - v_I}{t_F - t_I}$

(a=average acceleration; v=velocity; t=time; v_F=final velocity; v_I=initial velocity; t_F=final time; i_I=initial time)

Law of Universal Gravitation

$F = G\frac{m_1 m_2}{d^2}$

(F=force of attraction; m_1 and m_2=the masses of the two bodies; d=distance between the centers of m_1 and m_2; G=gravitational consistent)

Work Done by a Force

work = (force)(distance)

Power

power = $\frac{\text{work}}{\text{time}}$ (see above formula for work)

Kinetic Energy

$KE = \frac{mv^2}{2}$

(KE=kinetic energy; m=mass; v=velocity)

Specific Heat

$Q = cm\Delta t$

(Q=quantity of heat; c=specific heat; m=mass; Δt=change in temperature)

Electric Current - Strength

$I = \frac{Q}{t}$

(I=the current strength; Q=quantity of charge; t=time)

Momentum

momentum = (mass)(velocity)

Mass-Energy Equivalence

$E = mc^2$

(E=the energy [measured in ergs] equivalent to a mass m [measured in grams]; c=speed of light [measured in centimeters per second])

Power Expended in an Electric Appliance

$P = IV$

(P=power in watts; I=current; V=voltage)

Newton's Second Law of Motion

force=(mass)(acceleration)

Torque

$T = FR$

(T=torque; F=force; R=radius)

Boyle's Law when temperature constant:

$p_1V_1 = p_2V_2$

(p_1=original pressure; p_2=new pressure; V_1=original volume; V_2=new volume)

Wave Motion

$V = nl$

(V=wave velocity; n=wave frequency; l=wavelength)

Illumination on a Surface Perpendicular to the Luminous Flux

$E = \frac{I}{r^2}$

(E=illumination; I=intensity of the source; r=distance from source to surface perpendicular to the beam)

Focal Length of Mirrors and Lenses

$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$

(f=focal length; d_o=object distance; d_i=image distance)

Images in Mirrors and Lenses

$\frac{h}{h_o} = \frac{d_i}{d_o}$

(h=image height; h_o=object height; d_i=image distance; d_o=object distance)

Ohm's Law

$I = \frac{V}{R}$

(I=the current flowing in a conductor; V=the potential difference applied to its ends; R=its resistance)