SCIENCE *physics laws & formulas*

Mass Density

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

Speed

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

Acceleration

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

(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

$$\text{power} = \frac{\text{work}}{\text{time}}$$ (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

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

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

Ohm's Law

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

(I=strength of the current flowing in a conductor; V=the potential difference across the conductor; R=its resistance)