Formula			*Units for symbols*		
$\rho = \frac{m}{V}$	$P_1V_1 = P_2V_2$	$\theta = \frac{X_\theta - X_0}{X_{100} - X_0} \times 100$	ρ(density)=kg m^{-3} m(mass)= kg **V**(volume)= m^3 **W**(weight) = N g = N kg^{-1} v(velocity) =m s^{-1} d(distance) = m s(displacement)=m t(time)= s a(acc)= m s^{-2}	Moment= Nm F(force) = N W(work) = J E(energy) =J **P**(power)= W P(pressure) =Pa or Nm^{-2} f(frequency)= Hz λ(wavelength)= m T(period) = s	R(resistance) = Ω I(current) = A V(voltage) =V Ɛ(e.m.f) =V Q(charge) =C **Q**(energy) = J **c**(s.h.c.)= J kg^{-1} K^{-1} $\Delta\theta$ = K or °C l_f (s.l.h. of fusion) = J kg^{-1} l_v (s.l.h. of vap.) = J kg^{-1}
W =mg	P = hρg	**Q**= m**c**Δθ			
Ave speed= $\frac{\text{total dist}}{\text{total time}}$	$P = \frac{F}{A}$	**Q**= ml_f **Q**= ml_v			
$a = \frac{v - u}{t}$	$v = f\lambda$ $f = \frac{1}{T}$	Cost of electricity= Unit cost($/kWh) X Energy (kWh)			
$v = u + at$ $s = ut + \frac{1}{2}at^2$ $v^2 = u^2 + 2as$	$n = \frac{\sin i}{\sin r} = \frac{c}{v}$ $\sin c = \frac{1}{n}$	$P = IV = I^2R = \frac{V^2}{R}$ $E = IVt = I^2Rt = \frac{V^2}{R}t$			
Moment = Fd (perpendicular dist from pivot)	F = ma (Net force)	W = Fs (dist moved in the dir of the force)	***Principle of Moments:*** When a body is in equilibrium, the sum of clockwise moments about a pivot is equal to the sum of anticlockwise moments about the same pivot. ***Faraday's Law of Electromagnetic Induction:*** The e.m.f induced in a conductor is proportional to the rate of change of magnetic lines of force linking the circuit. ***Lenz's Law:*** The direction of the induced e.m.f, and hence the induced current in a closed circuit, is always such that its magnetic effect opposes the motion or change producing it.		
$P = \frac{W}{t} = \frac{E}{t}$	Q = It V = IR	$\frac{N_p}{N_s} = \frac{V_p}{V_s} = \frac{I_s}{I_p}$			
$E_k = \frac{1}{2}mv^2$ $E_p = mgh$	$V = \frac{W}{Q}$	$\mathcal{E} = \frac{W}{Q}$			

SCIENCE AND MATHS SPECIALIST

1st Law of Reflection:
The incident ray, the reflected ray and the normal to the reflecting surface all lie in the same plane.

2nd Law of Reflection:
The angle of incidence is equal to the angle of reflection.

Characteristics of the image formed by a plane mirror:
1) The image is of the same size as the object.
2) Laterally inverted. 3) It is upright.
4) It is virtual.
5) The image distance is equal to the object distance.

Total internal reflection is the reflection of light as it travels from an optically ***denser medium to a less dense*** medium and in which the angle of incidence is ***greater*** than the critical angle.

	Series	Parallel
Current	$I_1 = I_2 = I_3$	$I_t = I_1 + I_2 + I_3$
Voltage	$V_t = V_1 + V_2 + V_3$	$V_1 = V_2 = V_3$
R(Ω) $R = \rho\frac{l}{A}$	$R_t = R_1 + R_2 + R_3$	$\frac{1}{R_t} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$
R=V/I I =Q/t	**Resistance is defined as the ratio of potential difference to the current flowing through the conductor.**	

Ohm's Law states that the current through a metallic conductor is directly proportional to the potential difference across it if the temperature and physical conditions remains constant.

Object distance, u	Image formed by a lens
u = ∞ **Use:** Telescope	**Type:**Real, Inverted, Diminished **Image dist:**Opp side of lens; at f
u > 2f **Use:** Camera	**Type:**Real, Inverted, Diminished **Image dist:**Opp side of lens; f<v<2f
u = 2f **Use:** Photocopier	**Type:**Real, Inverted, Same size **Image dist:**Opp side of lens; at 2f
f< u < 2f **Use:** Projector	**Type:**Real, Inverted, Magnified **Image dist:**Opp side of lens; >2f
u = f **Use:** Spotlight	**Type:**Virtual, Upright, Magnified **Image dist:** Same side as lens; at ∞
u < f **Use:** Magnifying glass	**Type:**Virtual, Upright, Magnified **Image dist:** Same side as lens; behind object.

(f=focal length, u=object dist, v=image dist)

Newton's First Law: An object at rest will remain at rest, an object in motion will continue its motion in a straight line **unless a NET external force acts on it.**

Newton's Second law:
The acceleration of an object is directly proportional to the resultant force acting on the object.
The net force acting upon an object is equal to the product of the mass and the acceleration of the object. (F=ma)

Newton's Third law:
For every action, there is an equal and opposite reaction.