Physics Equations

Motion Equations

Speed = Distance ÷ Time (Velocity = Distance ÷ Time)	s = d ÷ t (v = d ÷ t)
Acceleration = Change in Speed ÷ Time	a = (Final Speed – Initial Speed) ÷ t a = (v - u) ÷ t
(Higher only) Momentum = Mass x Velocity	P = m x v

Force & Work Equations

Force = Mass x Acceleration	F = m x a
Work done = Force x Distance	W = F x d
Power = Work ÷ Time	P = W ÷ t
Weight = Mass x Gravity	W = m x g
Density = Mass ÷ Volume	ρ = m ÷ V
Force on a Spring = Spring Constant x Extension	F = k x X

Energy Equations

Kinetic Energy = $\frac{1}{2}$ x Mass x Velocity x Velocity	KE = $\frac{1}{2}$ x m x v^2
Gravitational Potential Energy = Mass x Gravity x Height	GPE = m x g x h
Efficiency = Useful Energy out ÷ Total Energy in	

Wave Equations

Wave Speed = Wavelength x Frequency	$s = \lambda \times f$
Wave Speed = Distance ÷ Time	$v = d \div t$

Electricity Equations

Energy = Charge x Voltage	$E = Q \times V$
Charge = Current x Time	$Q = I \times t$
Voltage = Current x Resistance	$V = I \times R$
Power = Energy ÷ Time	$P = E \div t$
Power = Current x Voltage	$P = I \times V$
Power = (Current)^2 x Resistance	$P = I^2 \times R$

Units

Distance = Metres (m) Time = Seconds (s) Speed (Velocity) = Metres per Second (m/s) Acceleration = Metres per Second Squared (m/s^2) Force = Newtons (N) Mass = Kilograms (kg) Work = Joules Energy = Joules Gravity = Newtons per kilogram (N/kg)	Momentum = Kilograms metres per second (kgm/s) Volume = Metres cubed (m^3) Power = Watts (W) Charge = Coulombs (C) Current = Amps (A) Voltage = Volts (V) Resistance = Ohms (Ω) Wavelength = Metres (m) Frequency = Hertz (Hz)

On Earth, gravity = 10N/kg

Rearranging Equations