

Physics Equations

Motion Equations

Speed = Distance \div Time (Velocity = Distance \div Time)	$s = d \div t$ $(v = d \div t)$
Acceleration = Change in Speed \div Time	$a = (\text{Final Speed} - \text{Initial Speed}) \div t$ $a = (v - u) \div t$
(Higher only) Momentum = Mass \times Velocity	$P = m \times v$

Force & Work Equations

Force = Mass \times Acceleration	$F = m \times a$
Work done = Force \times Distance	$W = F \times d$
Power = Work \div Time	$P = W \div t$
Weight = Mass \times Gravity	$W = m \times g$
Density = Mass \div Volume	$\rho = m \div V$
Force on a Spring = Spring Constant \times Extension	$F = k \times X$

Energy Equations

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

Wave Equations

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

Electricity Equations

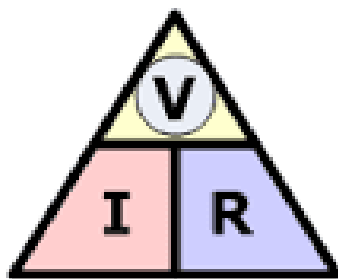
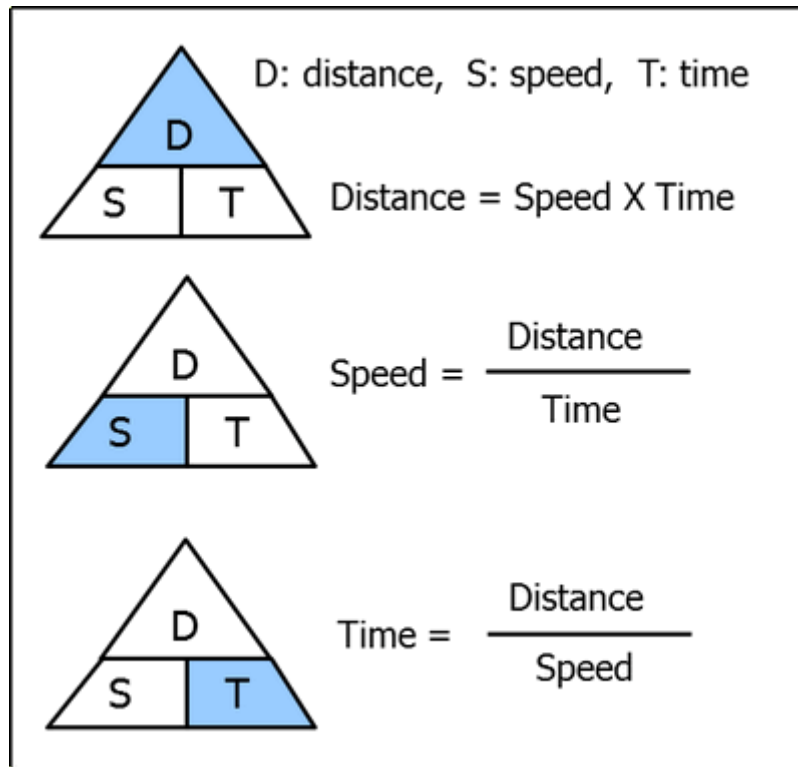
Energy = Charge x Voltage	$E = Q \times V$
Charge = Current x Time	$Q = I \times t$
Voltage = Current x Resistance	$V = I \times R$
Power = Energy ÷ Time	$P = E \div t$
Power = Current x Voltage	$P = I \times V$
Power = (Current) ² x Resistance	$P = I^2 \times R$

Units

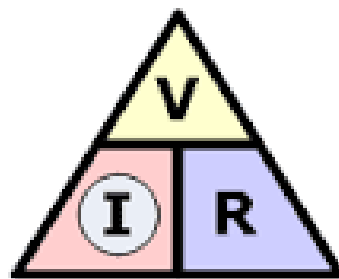
Distance = Metres (m) Time = Seconds (s) Speed (Velocity) = Metres per Second (m/s) Acceleration = Metres per Second Squared (m/s ²) Force = Newtons (N) Mass = Kilograms (kg) Work = Joules Energy = Joules Gravity = Newtons per kilogram (N/kg)	Momentum = Kilograms metres per second (kgm/s) Volume = Metres cubed (m ³) Power = Watts (W) Charge = Coulombs (C) Current = Amps (A) Voltage = Volts (V) Resistance = Ohms (Ω) Wavelength = Metres (m) Frequency = Hertz (Hz)
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On Earth, gravity = 10N/kg

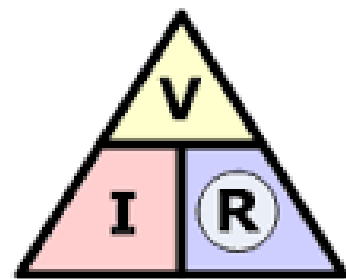
Rearranging Equations



$$\text{V} = I \times R$$



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



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