

# Physics Equations List



Department of  
Science

Equations you need to learn:		
Kinetic Energy	$E_k = \frac{1}{2} \times m \times v^2$	Kinetic energy = $0.5 \times \text{mass} \times \text{velocity}^2$
Gravitational potential	$E_p = m \times g \times h$	GPE = mass x gravitational field strength x height
Power 1	$P = E \div t$	Power = $\frac{\text{energy transferred}}{\text{time}}$
Power 2	$P = W \div t$	Power = $\frac{\text{work done}}{\text{time}}$
Efficiency 1	Efficiency = useful power output $\div$ total power in	
Efficiency 2	Efficiency = useful energy output $\div$ total energy in	
Charge	$Q = I \times t$	Charge = current x time
Potential difference	$V = I \times R$	Potential difference = current x resistance
Power 3	$P = V \times I$	Power = potential difference x current
Power 4	$P = I^2 \times R$	Power = current <sup>2</sup> x resistance
Energy	$E = Q \times V$	Energy transferred = charge x potential difference
Density	$\rho = m \div \text{vol}$	Density = $\frac{\text{mass}}{\text{Volume}}$
Weight	$W = m \times g$	Weight = mass x strength of gravity
Work done	$W = F \times s$	Work done = force x distance
Force	$F = k \times e$	Force acting on a spring = spring constant x extension
Force 2	$F = m \times a$	Force = mass x acceleration
Momentum	$P = m \times v$	Momentum = mass x velocity
Speed 1	$v = s \div t$	Velocity of an object = $\frac{\text{distance}}{\text{time}}$
Speed 2	$v = f \times \lambda$	Speed of a wave = frequency x wavelength
Acceleration	$a = \Delta v \div t$	Acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$
These are given to you in the exam:		
Elastic energy	$E_e = \frac{1}{2} \times k \times e^2$	Elastic potential energy = $0.5 \times \text{spring constant} \times \text{extension}^2$
Specific heat capacity	$\Delta E = m \times c \times \theta$	Change in thermal energy = mass x specific heat capacity x temperature
Latent heat	$E = m \times L$	Energy = mass x latent heat
Acceleration	$v^2 - u^2 = 2as$	(Final velocity) <sup>2</sup> – (Initial velocity) <sup>2</sup> = 2 x acceleration x distance
Period	$T = 1 \div f$	Period of a wave = $\frac{1}{\text{frequency}}$
Force	$F = B \times I \times l$	Force on a conductor carrying a current = magnetic flux density x current x length
Potential difference	$V_p \times I_p = V_s \times I_s$	PD on primary coil x current on primary coil = PD on secondary coil x current on secondary coil