

## Physics Equations Sheet GCSE Combined Science: Trilogy (8464) and GCSE Combined Science: Synergy (8465)

## FOR USE IN JUNE 2024 ONLY

## **HT = Higher Tier only equations**

kinetic energy = 0.5 × mass × (speed) <sup>2</sup>	$E_k = \frac{1}{2} \ m \ v^2$
elastic potential energy = 0.5 × spring constant × (extension) <sup>2</sup>	$E_e = \frac{1}{2} k e^2$
gravitational potential energy = mass × gravitational field strength × height	$E_p = m g h$
change in thermal energy = mass × specific heat capacity × temperature change	$\Delta E = m \ c \ \Delta \theta$
$power = \frac{energy transferred}{time}$	$P = \frac{E}{t}$
$power = \frac{work done}{time}$	$P = \frac{W}{t}$
$efficiency = \frac{useful output energy transfer}{total input energy transfer}$	
$efficiency = \frac{useful power output}{total power input}$	
charge flow = current × time	Q = I t
potential difference = current × resistance	V = IR
power = potential difference × current	P = VI
power = (current) <sup>2</sup> × resistance	$P = I^2 R$
energy transferred = power × time	E = P t

	energy transferred = charge flow × potential difference	E = Q V
нт	potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil	$V_p I_p = V_s I_s$
	$density = \frac{mass}{volume}$	$ \rho = \frac{m}{V} $
	thermal energy for a change of state = mass × specific latent heat	E = m L
	weight = mass × gravitational field strength	W=m g
	work done = force × distance (along the line of action of the force)	W = F s
	force = spring constant × extension	F = k e
	distance travelled = speed × time	s = v t
	$acceleration = \frac{change in velocity}{time taken}$	$a = \frac{\Delta v}{t}$
	(final velocity) $^2$ – (initial velocity) $^2$ = 2 × acceleration × distance	$v^2 - u^2 = 2 \ a \ s$
	resultant force = mass × acceleration	F = m a
нт	momentum = mass × velocity	p = m v
	$period = \frac{1}{frequency}$	$T = \frac{1}{f}$
	wave speed = frequency × wavelength	$v = f \lambda$
нт	force on a conductor (at right angles to a magnetic field) carrying a current = magnetic flux density × current × length	F = B I l

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