

Every AQA GCSE Physics equation

35 equations with symbols and units. AQA prints these equations on the Physics equation sheet you get in the exam. It was provided in 2026, the 2027 sheet is unchanged, and AQA has confirmed sheets will continue from 2028. Use this guide to learn to recognise each equation, choose the right one and apply it with the correct units.

Higher Higher tier only **Separate** Separate Physics only. Unflagged equations apply to Combined Science and Physics at both tiers.

Transcribed from the AQA GCSE Physics (8463) and Combined Science: Trilogy (8464) specifications and checked against AQA's June 2027 Physics equation sheets. Practise with your school's copy of the current AQA Physics equation sheet. Online version: www.examva.com/gcse-physics/equations. Illustrated AQA GCSE Physics notes at www.examva.com; the first topic is free.

EQUATION	SYMBOLS AND UNITS	FLAGS
Energy		
$E_k = \frac{1}{2} m v^2$ kinetic energy = 0.5 × mass × speed ²	<i>E_k</i> kinetic energy (J); <i>m</i> mass (kg); <i>v</i> speed (m/s)	
$E_e = \frac{1}{2} k e^2$ elastic potential energy = 0.5 × spring constant × extension ²	<i>E_e</i> elastic potential energy (J); <i>k</i> spring constant (N/m); <i>e</i> extension (m)	
$E_p = m g h$ gravitational potential energy = mass × gravitational field strength × height	<i>E_p</i> gravitational potential energy (J); <i>m</i> mass (kg); <i>g</i> gravitational field strength (always given) (N/kg); <i>h</i> height (m)	
$\Delta E = m c \Delta \theta$ change in thermal energy = mass × specific heat capacity × temperature change	ΔE change in thermal energy (J); <i>m</i> mass (kg); <i>c</i> specific heat capacity (J/kg °C); $\Delta \theta$ temperature change (°C)	
$P = E / t$ power = energy transferred ÷ time	<i>P</i> power (W); <i>E</i> energy transferred (J); <i>t</i> time (s)	
$P = W / t$ power = work done ÷ time	<i>P</i> power (W); <i>W</i> work done (J); <i>t</i> time (s)	
efficiency = useful output energy transfer / total input energy transfer efficiency = useful output energy transfer ÷ total input energy transfer	efficiency (no unit (ratio))	
efficiency = useful power output / total power input efficiency = useful power output ÷ total power input	efficiency (no unit (ratio))	
Electricity		
$Q = I t$ charge flow = current × time	<i>Q</i> charge flow (C); <i>I</i> current (A); <i>t</i> time (s)	
$V = I R$ potential difference = current × resistance	<i>V</i> potential difference (V); <i>I</i> current (A); <i>R</i> resistance (Ω)	
$P = V I$ power = potential difference × current	<i>P</i> power (W); <i>V</i> potential difference (V); <i>I</i> current (A)	
$P = I^2 R$ power = current ² × resistance	<i>P</i> power (W); <i>I</i> current (A); <i>R</i> resistance (Ω)	
$E = P t$ energy transferred = power × time	<i>E</i> energy transferred (J); <i>P</i> power (W); <i>t</i> time (s)	
$E = Q V$ energy transferred = charge flow × potential difference	<i>E</i> energy transferred (J); <i>Q</i> charge flow (C); <i>V</i> potential difference (V)	
$V_p \times I_p = V_s \times I_s$ pd across primary × current in primary = pd across secondary × current in secondary	<i>V_p</i> potential difference across primary coil (V); <i>I_p</i> current in primary coil (A); <i>V_s</i> potential difference across secondary coil (V); <i>I_s</i> current in secondary coil (A)	Higher

Particle model of matter

$$\rho = m / V$$

density = mass ÷ volume

ρ density (kg/m³); m mass (kg); V volume (m³)

$$E = m L$$

energy for a change of state = mass × specific latent heat

E energy for a change of state (J); m mass (kg); L specific latent heat (J/kg)

$$p V = \text{constant}$$

pressure × volume = constant

p pressure (Pa); V volume (m³)

Separate

Forces and motion

$$W = m g$$

weight = mass × gravitational field strength

W weight (N); m mass (kg); g gravitational field strength (always given) (N/kg)

$$W = F s$$

work done = force × distance

W work done (J); F force (N); s distance (m)

$$F = k e$$

force = spring constant × extension

F force (N); k spring constant (N/m); e extension (m)

$$M = F d$$

moment of a force = force × distance

M moment of a force (Nm); F force (N); d distance (m)

Separate

$$p = F / A$$

pressure = force normal to a surface ÷ area of that surface

p pressure (Pa); F force normal to a surface (N); A area of that surface (m²)

Separate

$$p = h \rho g$$

pressure due to a column of liquid = height of column × density of the liquid × gravitational field strength

p pressure (Pa); h height of the column (m); ρ density of the liquid (kg/m³); g gravitational field strength (always given) (N/kg)

Separate

Higher

$$s = v t$$

distance travelled = speed × time

s distance travelled (m); v speed (m/s); t time (s)

$$a = \Delta v / t$$

acceleration = change in velocity ÷ time taken

a acceleration (m/s²); Δv change in velocity (m/s); t time (s)

$$v^2 - u^2 = 2 a s$$

(final velocity)² – (initial velocity)² = 2 × acceleration × distance

v final velocity (m/s); u initial velocity (m/s); a acceleration (m/s²); s distance (m)

$$F = m a$$

resultant force = mass × acceleration

F resultant force (N); m mass (kg); a acceleration (m/s²)

$$p = m v$$

momentum = mass × velocity

p momentum (kg m/s); m mass (kg); v velocity (m/s)

Higher

$$F = m \Delta v / \Delta t$$

force = change in momentum ÷ time taken

F force (N); m mass (kg); Δv change in velocity (m/s); Δt time taken (s)

Separate

Higher

Waves

$$T = 1 / f$$

period = 1 ÷ frequency

T period (s); f frequency (Hz)

$$v = f \lambda$$

wave speed = frequency × wavelength

v wave speed (m/s); f frequency (Hz); λ wavelength (m)

$$\text{magnification} = \text{image height} / \text{object height}$$

magnification = image height ÷ object height

magnification (no unit (ratio))

Separate

Magnetism and electromagnetism

$$F = B I l$$

force = magnetic flux density × current × length

F force (N); B magnetic flux density (T); I current (A); l length (m)

Higher

$$V_p / V_s = n_p / n_s$$

pd across primary ÷ pd across secondary = turns on primary ÷ turns on secondary

V_p potential difference across primary coil (V); V_s potential difference across secondary coil (V); n_p number of turns on primary coil (no unit); n_s number of turns on secondary coil (no unit)

Separate

Higher