STUDY FORMULA BOOKLET

AQA GCSE Physics 8463 equation sheet

The AQA sheet for June 2027 prints all 35 GCSE Physics equations, six of them Higher Tier only. The specification still lists 23 to recall, so learn those.

IN THE BOOKLET printed in the official booklet LEARN IT not printed: students must recall it

Based on the official **Physics Equations Sheet, GCSE Physics (8463), AQA insert, for use in June 2027 only (35 equations; HT = Higher Tier only equations)**, with what to learn and exam tips added by CuratedPrep.

Energy and power

The sheet itself has no headings. CuratedPrep groups the 35 equations by topic without changing the sheet's order. Notes show whether the specification puts each one on the recall list or the sheet list, and which are Higher Tier (HT) only or physics only.

Kinetic energy Spec recall list. Ek in joules (J), m in kg, v in m/s.	$E_k = \frac{1}{2}mv^2$	IN THE BOOKLET
Elastic potential energy Spec sheet list. Ee in J, k spring constant in N/m, e extension in m. Valid up to the limit of proportionality.	$E_e = \frac{1}{2}ke^2$	IN THE BOOKLET
Gravitational potential energy Spec recall list. Ep in J, m in kg, g gravitational field strength in N/kg, h height in m.	$E_p = mgh$	IN THE BOOKLET
Change in thermal energy Spec sheet list. ΔE in J, m in kg, c specific heat capacity in J/kg °C, Δθ temperature change in °C.	$\Delta E = mc\Delta\theta$	IN THE BOOKLET
Power (energy transferred) Spec recall list. P in watts (W), E energy transferred in J, t in seconds (s).	$P = \frac{E}{t}$	IN THE BOOKLET
Power (work done) Spec recall list. W work done in J, t in s. One watt is one joule per second.	$P = \frac{W}{t}$	IN THE BOOKLET
Efficiency (energy) Spec recall list. A ratio with no unit. Multiply by 100 for a percentage.	$\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$	IN THE BOOKLET
Efficiency (power) Spec recall list. Same idea using power in W.	$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$	IN THE BOOKLET

Electricity

Charge flow Spec recall list. Q in coulombs (C), I in amperes (A), t in s.	$Q = It$	IN THE BOOKLET
Potential difference Spec recall list. V in volts (V), I in A, R resistance in ohms (Ω).	$V = IR$	IN THE BOOKLET
Electrical power Spec recall list. P in W, V in V, I in A.	$P = VI$	IN THE BOOKLET

Power in a resistor Spec recall list. P in W, I in A, R in Ω.	$P = I^2R$	IN THE BOOKLET
Energy transferred (power and time) Spec recall list. E in J, P in W, t in s.	$E = Pt$	IN THE BOOKLET
Energy transferred (charge and potential difference) Spec recall list. E in J, Q in C, V in V.	$E = QV$	IN THE BOOKLET

Density, thermal energy and gases

Density Spec recall list. ρ in kg/m^3, m in kg, V in m^3.	$\rho = \frac{m}{V}$	IN THE BOOKLET
Thermal energy for a change of state Spec sheet list. E in J, m in kg, L specific latent heat in J/kg.	$E = mL$	IN THE BOOKLET
Gas pressure and volume Spec sheet list. Physics only. For a fixed mass of gas at constant temperature, so p1V1 = p2V2.	$pV = \text{constant}$	IN THE BOOKLET

Forces, work and pressure

Weight Spec recall list. W in newtons (N), m in kg, g in N/kg.	$W = mg$	IN THE BOOKLET
Work done Spec recall list. W in J, F in N, s distance moved along the line of action of the force in m.	$W = Fs$	IN THE BOOKLET
Force on a spring Spec recall list. F in N, k in N/m, e extension in m. Up to the limit of proportionality.	$F = ke$	IN THE BOOKLET
Moment of a force Spec recall list. Physics only. M in newton metres (N m), F in N, d distance normal to the force in m.	$M = Fd$	IN THE BOOKLET
Pressure Spec recall list. Physics only. p in pascals (Pa), F force normal to the surface in N, A area in m^2.	$p = \frac{F}{A}$	IN THE BOOKLET
Pressure due to a column of liquid Spec sheet list. HT only and physics only. p in Pa, h height of column in m, ρ density in kg/m^3, g in N/kg.	$p = h\rho g$	IN THE BOOKLET

Motion and momentum

Distance travelled Spec recall list. s in m, v speed in m/s, t in s.	$s = vt$	IN THE BOOKLET
Acceleration Spec recall list. a in m/s^2, Δv change in velocity in m/s, t time taken in s.	$a = \frac{\Delta v}{t}$	IN THE BOOKLET

Uniform acceleration Spec sheet list. v final and u initial velocity in m/s, a in m/s^2, s distance in m.	$v^2 - u^2 = 2as$	IN THE BOOKLET
Resultant force Spec recall list. F resultant force in N, m in kg, a in m/s^2.	$F = ma$	IN THE BOOKLET
Momentum Spec recall list. HT only. p in kg m/s, m in kg, v in m/s.	$p = mv$	IN THE BOOKLET
Force and change in momentum Spec sheet list. HT only and physics only. m Δv is the change in momentum in kg m/s, Δt time taken in s.	$F = \frac{m\Delta v}{\Delta t}$	IN THE BOOKLET

Waves and lenses

Period Spec sheet list. T in s, f frequency in hertz (Hz).	$T = \frac{1}{f}$	IN THE BOOKLET
Wave speed Spec recall list. v in m/s, f in Hz, λ wavelength in m.	$v = f\lambda$	IN THE BOOKLET
Magnification Spec sheet list. Physics only (lenses). A ratio, so both heights need the same unit.	$\text{magnification} = \frac{\text{image height}}{\text{object height}}$	IN THE BOOKLET

Magnetism and transformers

All three are Higher Tier only.

Force on a conductor in a magnetic field Spec sheet list. HT only. F in N, B magnetic flux density in tesla (T), I in A, l length in m. Conductor at right angles to the field.	$F = BIl$	IN THE BOOKLET
Transformer: turns ratio Spec sheet list. HT only and physics only (the Combined Science Trilogy sheet for June 2024 does not print it). p is primary, s is secondary, n is the number of turns.	$\frac{V_p}{V_s} = \frac{n_p}{n_s}$	IN THE BOOKLET
Transformer: power in equals power out Spec sheet list. HT only. For a 100 per cent efficient transformer. Printed on the Trilogy sheet too.	$V_p I_p = V_s I_s$	IN THE BOOKLET

Rules the sheet does not print

Specification content you must know, with no matching line on the equation sheet.

Series circuit: total resistance Same current through each component; the supply potential difference is shared between them.	$R_{\text{total}} = R_1 + R_2$	LEARN IT
Parallel circuit: total current Same potential difference across each branch. Total resistance is less than the smallest single resistor.	$I_{\text{total}} = I_1 + I_2$	LEARN IT

Conservation of momentum HT only. In a closed system. Use p = mv for each object and treat direction with plus and minus signs.	$\text{total momentum before} = \text{total momentum after}$	LEARN IT
Principle of moments Physics only. For a balanced object about a pivot. Use M = Fd on each side.	$\text{total clockwise moment} = \text{total anticlockwise moment}$	LEARN IT

Learn these: not in the booklet

The 23 equations on the specification recall list

Weight, work done, force on a spring, moment, pressure, distance travelled, acceleration, resultant force, momentum, kinetic energy, gravitational potential energy, both power equations, both efficiency equations, wave speed, charge flow, V = IR, P = VI, P = I squared R, E = Pt, E = QV and density. Notes above say Spec recall list. The June 2027 sheet prints them, but AQA's specification still expects you to know them.

Typical speeds

Walking about 1.5 m/s, running about 3 m/s and cycling about 6 m/s. The speed of sound in air is about 330 m/s.

Free fall near the Earth's surface

$a \approx 9.8\ \text{m/s}^2$

Use g = 9.8 N/kg for weight and potential energy unless the question gives another value.

Series and parallel circuits

Series: Rtotal = R1 + R2 and the same current everywhere. Parallel: the same potential difference across each branch and Itotal = I1 + I2.

Conservation of momentum (Higher Tier)

In a closed system, total momentum before an event equals total momentum after it.

Principle of moments (physics only)

For a balanced object, the total clockwise moment about a pivot equals the total anticlockwise moment.

Using the booklet in the exam

- Check the sheet for the quantity you are asked for, then check the unit in the question before you substitute.
- Convert units first: grams to kilograms, centimetres to metres, minutes to seconds, kilowatts to watts, cm^2 to m^2.
- Write the equation, then the substitution, then the answer with its unit. Marks are given for each stage.
- Pick the right power equation: P = E/t, P = W/t, P = VI or P = I squared R depending on the data you are given.
- Foundation students can skip the six HT rows, and Combined Science students can skip the seven physics-only rows.

Based on: AQA GCSE Physics 8463, Physics Equations Sheet, for use in June 2027 only; AQA GCSE Physics 8463 specification, Appendix A: Physics equations; AQA news, GCSE Maths and Sciences formulae and equation sheets for 2027 and 2028 onwards; AQA GCSE Combined Science Trilogy 8464, Physics Equations Sheet, for use in June 2024 only. Statistical tables are calculated by CuratedPrep to the same layout. Updated 31 October 2026. Always practise with the version of the official booklet your exam uses. More free sheets and topic worksheets at curatedprep.com.