STUDY FORMULA BOOKLET

OxfordAQA International GCSE Physics 9203 equation sheet

The 9203 sheet prints 30 equations. E = VQ, echo distance, series and parallel rules, conservation of momentum and the principle of moments are not printed, so learn them.

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

Based on the official **9203 GCSE Physics Equation Sheet, Oxford AQA International GCSE Physics (9203) insert IB/G/Insert to International GCSE Physics/E2, for exams June 2018 onwards, Version 2.0**, with what to learn and exam tips added by CuratedPrep.

Motion and forces

The sheet has no headings. CuratedPrep groups the 30 equations by topic and keeps the sheet's own order. The sheet marks no tier or Higher-only equations: 9203 is a linear course with two papers.

Velocity v velocity in m/s, s displacement in m, t time in s. The specification says this equation also gives average speed.	$v = \frac{s}{t}$	IN THE BOOKLET
Acceleration 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
Resultant force (Newton's second law) F force in newtons (N), m mass in kg, a acceleration in m/s^2.	$F = m \times a$	IN THE BOOKLET
Momentum p momentum in kg m/s, m mass in kg, v velocity in m/s.	$p = m \times v$	IN THE BOOKLET
Force from change in momentum F in N, Δp change in momentum in kg m/s, t time in s.	$F = \frac{\Delta p}{t}$	IN THE BOOKLET
Weight W weight in N, m mass in kg, g gravitational field strength in N/kg. You are not expected to know the value of g: the question gives it.	$W = m \times g$	IN THE BOOKLET
Force on a spring F in N, k spring constant in N/m, e extension in m. Valid until the limit of proportionality.	$F = k \times e$	IN THE BOOKLET

Work, power and energy

Work done W in joules (J), F in N, d distance moved in the direction of the force in m.	$W = F \times d$	IN THE BOOKLET
Power (work done) P power in watts (W), W work done in J, t in s.	$P = \frac{W}{t}$	IN THE BOOKLET
Power (energy transferred) P in W, E energy transferred in J, t in s.	$P = \frac{E}{t}$	IN THE BOOKLET

Change in gravitational potential energy Ep in J, m in kg, g gravitational field strength (acceleration of free fall) in N/kg, h height in m.	$E_p = m \times g \times h$	IN THE BOOKLET
Kinetic energy Ek in J, m in kg, v in m/s. Double the speed and the kinetic energy is four times as large.	$E_k = \frac{1}{2} \times m \times v^2$	IN THE BOOKLET
Elastic potential energy Ee in J, k in N/m, e extension in m.	$E_e = \frac{1}{2} \times k \times e^2$	IN THE BOOKLET

Moments

Moment of a force M in N m, F in N, d perpendicular distance from the line of action of the force to the pivot in m.	$M = F \times d$	IN THE BOOKLET

Waves, refraction and lenses

Wave speed v speed in m/s, f frequency in hertz (Hz), λ wavelength in m.	$v = f \times \lambda$	IN THE BOOKLET
Refractive index (angles) n refractive index (no unit), i angle of incidence, r angle of refraction.	$n = \frac{\sin i}{\sin r}$	IN THE BOOKLET
Refractive index (critical angle) n refractive index, c critical angle. You do not need to recall values of critical angles.	$n = \frac{1}{\sin c}$	IN THE BOOKLET
Lens magnification No symbols are defined on the sheet for this line. Both heights in the same unit, so magnification has no unit.	$\text{magnification} = \frac{\text{image height}}{\text{object height}}$	IN THE BOOKLET

Thermal energy

Specific heat capacity E energy in J, m in kg, c specific heat capacity in J/kg °C, Δθ temperature change in °C.	$E = m \times c \times \Delta\theta$	IN THE BOOKLET
Latent heat of vaporisation E in J, m in kg, LV specific latent heat of vaporisation in J/kg. Liquid to vapour, no change in temperature.	$E = m \times L_V$	IN THE BOOKLET
Latent heat of fusion E in J, m in kg, LF specific latent heat of fusion in J/kg. Solid to liquid, no change in temperature.	$E = m \times L_F$	IN THE BOOKLET

Efficiency

Efficiency (energy) Printed with the times 100 per cent in brackets. The specification says you may be asked for a decimal or a percentage.	$\text{efficiency} = \frac{\text{useful energy out}}{\text{total energy in}}\ (\times 100\%)$	IN THE BOOKLET
Efficiency (power) Same idea using power in W.	$\text{efficiency} = \frac{\text{useful power out}}{\text{total power in}}\ (\times 100\%)$	IN THE BOOKLET

Electricity

Current and charge I current in amperes (A), Q charge flow in coulombs (C), t in s.	$I = \frac{Q}{t}$	IN THE BOOKLET
Potential difference (energy and charge) V potential difference in volts (V), E energy transferred in J, Q charge in C.	$V = \frac{E}{Q}$	IN THE BOOKLET
Ohm's law V in V, I in A, R resistance in ohms (Ω).	$V = I \times R$	IN THE BOOKLET
Electrical power P in W, I in A, V in V.	$P = I \times V$	IN THE BOOKLET
Energy from the mains E energy transferred in kilowatt-hours, P in kW, t in hours. You do not need to convert between kWh and joules.	$E\ (\text{kWh}) = P\ (\text{kW}) \times t\ (\text{h})$	IN THE BOOKLET

Transformers

Turns ratio Vp and Vs potential differences across the primary and secondary coils, np and ns the numbers of turns on them.	$\frac{V_p}{V_s} = \frac{n_p}{n_s}$	IN THE BOOKLET
Power in equals power out (100% efficient) Ip and Is currents in the primary and secondary coils. Applies to a transformer that is 100% efficient.	$V_p \times I_p = V_s \times I_s$	IN THE BOOKLET

Relationships the sheet does not print

Content the 9203 specification expects, with no line on the printed sheet. The specification does not label items as recall or select, so these are the ones to be sure of.

Energy transferred, charge and potential difference E in J, V in V, Q in C. The specification states this form; the sheet prints V = E/Q.	$E = V \times Q$	LEARN IT
Refractive index from wave speed The specification defines refractive index this way. No unit.	$n = \frac{\text{speed of light in vacuum (air)}}{\text{speed of light in the medium}}$	LEARN IT
Distance from an echo (ultrasound) s distance in m, v wave speed in m/s, t time in s. The specification gives this for ultrasound reflecting from boundaries. For an echo, t is the time for the out-and-back journey, so the boundary is at half of s.	$s = v \times t$	LEARN IT
Cost of mains electricity The specification asks you to calculate the cost from kilowatt-hours and the cost per kilowatt-hour, and from meter readings.	$\text{cost} = E\ (\text{kWh}) \times \text{cost per kWh}$	LEARN IT
Series circuit Combined resistance is the sum. Current is the same in each component; the supply potential difference is shared.	$R_{\text{total}} = R_1 + R_2$	LEARN IT

Parallel circuit Combined resistance is less than that of either component. The supply current splits between branches; the potential difference across each is the same.	$R_{\text{total}} < \text{each branch resistance}$	LEARN IT
Conservation of momentum In a closed system. The specification says calculations can involve two objects, such as collisions and explosions.	$\text{total momentum before} = \text{total momentum after}$	LEARN IT
Principle of moments For an object that is not turning, about any pivot. You may be asked for a force or its distance from the pivot.	$\text{total clockwise moment} = \text{total anticlockwise moment}$	LEARN IT

Learn these: not in the booklet

Graphs of motion

The gradient of a distance-time graph is speed. The gradient of a velocity-time graph is acceleration. The area under a velocity-time graph is the distance travelled.

Current from power

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

Rearranged from P = IV. The specification asks you to find the current through an appliance from its power and the supply potential difference, then the size of fuse needed.

Period and frequency

$$f = \frac{1}{T}$$

The specification asks you to find the period, and hence the frequency, of a supply from diagrams. It does not print this relationship, so CuratedPrep adds it.

Efficiency as a decimal

The sheet prints times 100 per cent in brackets. Know how to give efficiency as a decimal or as a percentage.

Rearranging

The sheet gives each equation in one form only. The specification lists changing the subject of an equation as a required skill, so practise every rearrangement.

Not required

You do not need the value of g, critical angle values, the centripetal force equation, or to convert between kWh and joules.

Using the booklet in the exam

- Find the quantity you want in the right-hand column of symbols, then pick the matching equation. The sheet has no headings.
- Two equations give power as P = W/t and P = E/t: choose by whether the question says work done or energy transferred.
- The sheet prints each equation one way round. Rearrange before you substitute, then give the answer with its unit.
- Use LV when a liquid boils or a gas condenses and LF when a solid melts or a liquid freezes.
- Magnification, E = VQ, echo distance and series and parallel rules are not printed with symbols or at all, so practise them without the sheet.

Based on: OxfordAQA International GCSE Physics 9203, Physics equation sheet insert, Version 2.0; OxfordAQA International GCSE Physics 9203 specification, Section 6.4 Physics equation sheet, Version 4.3. 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.