STUDY FORMULA BOOKLET

OxfordAQA International GCSE Combined Science 9204 physics equation sheet

The 9204 physics sheet prints 21 equations with symbols defined. It leaves out E = VQ, kWh energy and the series and parallel rules, so learn those.

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

Based on the official **9204 GCSE Physics Equation Sheet, International GCSE Combined Science (9204) insert IB/M/Insert to International GCSE Combined Science/E3, 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 21 equations by topic without changing the sheet's order.

Velocity v velocity in m/s, s displacement in m, t time in s. The specification says this 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 F force in newtons (N), m mass in kg, a acceleration in m/s^2.	$F = ma$	IN THE BOOKLET
Weight W weight in N, m in kg, g gravitational field strength in N/kg.	$W = mg$	IN THE BOOKLET
Force on a spring F in N, k spring constant in N/m, e extension in m.	$F = ke$	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.	$W = Fd$	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 in N/kg (acceleration of free fall), h height in m.	$E_p = mgh$	IN THE BOOKLET
Kinetic energy Ek in J, m in kg, v in m/s.	$E_k = \frac{1}{2}mv^2$	IN THE BOOKLET
Elastic potential energy Ee in J, k in N/m, e extension in m.	$E_e = \frac{1}{2}ke^2$	IN THE BOOKLET

Waves

Wave speed
v speed in m/s, f frequency in hertz (Hz), λ wavelength in m.

$$v = f\lambda$$

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.

$$E = mc\Delta\theta$$

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Latent heat of vaporisation
E in J, m in kg, LV specific latent heat of vaporisation in J/kg.

$$E = mL_V$$

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Latent heat of fusion
E in J, m in kg, LF specific latent heat of fusion in J/kg.

$$E = mL_F$$

IN THE BOOKLET

Efficiency

Efficiency (energy)
Printed with the times 100 per cent. The specification says you may give it as 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
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 in volts (V), E energy transferred in J, Q charge in C.

$$V = \frac{E}{Q}$$

IN THE BOOKLET

Potential difference (Ohm's law)
V in V, I in A, R resistance in ohms (Ω).

$$V = IR$$

IN THE BOOKLET

Electrical power
P in W, I in A, V in V.

$$P = IV$$

IN THE BOOKLET

Relationships the sheet does not print

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

Energy transferred (rearranged)
From the specification: E in J, V in V, Q in C. A rearrangement of V = E/Q.

$$E = VQ$$

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Energy from the mains
The specification gives this form for domestic energy use and cost. You do not convert between kWh and joules.

$$E\ (\text{kWh}) = P\ (\text{kW}) \times t\ (\text{h})$$

LEARN IT

Series circuit
Current is the same in each component; the supply potential difference is shared.

$$R_{\text{total}} = R_1 + R_2$$

LEARN IT

Parallel circuit Potential difference is the same across each branch and the supply current splits between the branches.	$\text{combined resistance} < \text{each branch resistance}$	LEARN IT

Learn these: not in the booklet

Energy transferred and charge

$E = VQ$

The specification writes this form; the sheet prints V = E/Q.

Domestic energy use

$E\ (\text{kWh}) = P\ (\text{kW}) \times t\ (\text{h})$

Use it with the cost per kWh to find the cost of mains electricity.

Series circuits

Combined resistance is the sum of the resistances; current is the same everywhere; the supply potential difference is shared.

Parallel circuits

Combined resistance is less than either component; the supply current splits between branches; potential difference is the same across each.

Efficiency as a decimal

The specification says you may be asked for efficiency as a decimal or a percentage, so know both forms.

Using the booklet in the exam

- Find the quantity you want in the right-hand column of symbols, then pick the matching equation.
- Two equations give power as P = W/t and P = E/t: choose by whether the question says work done or energy transferred.
- Use LV when a liquid boils or a gas condenses and LF when a solid melts or a liquid freezes.
- Convert to kg, m, s and A before you substitute, then give the answer with its unit.
- The sheet prints efficiency with times 100 per cent. Check whether the question wants a decimal or a percentage.

Based on: OxfordAQA International GCSE Combined Science 9204, Physics equation sheet insert, Version 2.0; OxfordAQA International GCSE Combined Science 9204 specification, Section 6.4 Physics equation sheet, Version 5.4. 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.