



GCSE 2026 Formulae & Equations Sheet

Maths • Physics • Chemistry • Biology

Created by RS Remote Tutoring

A smooth revision reference designed to help GCSE students practise formula selection, units, rearranging and exam-style application before the 2026 exams.

Student-friendly GCSE revision download

You cannot take this PDF into the exam. Use it for practice, revision and mock preparation.

START HERE

How to Use This GCSE Formula Sheet

Important 2026 exam note

For 2026, GCSE Mathematics students are expected to receive an official formulae sheet in the exam, and GCSE Physics/Combined Science students are expected to receive an official equations sheet. This RS Remote Tutoring version is a revision resource, not an official exam insert. Always check your exam board and tier before the exam.

1. Learn what each symbol means

Formula + units + meaning

A formula only helps if you know what every letter stands for and which units are needed.

2. Practise rearranging

cover rearrange check

Many marks come from changing the subject before substituting values.

3. Apply, do not just copy

method marks = correct formula + substitution + answer

Exam questions normally test application, not just remembering a line from a sheet.

4. Use RAG revision

Red = stuck • Amber = nearly • Green = confident

Mark each formula after practice questions and revisit the red/amber ones first.

5. Check the tier

HT = Higher Tier only

Some equations are needed only by Higher Tier students, depending on the subject and exam board.

6. Keep units visible

write units beside every number

Unit mistakes are one of the easiest ways to lose marks in Maths and Science calculations.

Quick exam reminder

You can use this PDF at home, in tuition lessons and for mock preparation. In the real GCSE exam, use only the official sheet provided by the exam board on the day.

MATHS

GCSE Maths Formulae - Core & Foundation

These are the high-frequency formulae students should practise until they can choose them quickly in exam-style questions.

Area of a trapezium

$$A = \frac{1}{2}(a + b)h$$

a and b are the parallel sides; h is the perpendicular height.

Volume of a prism

$$V = \text{area of cross-section} \times \text{length}$$

Works for triangular prisms, cylinders and other prisms.

Circle circumference

$$C = 2\pi r = \pi d$$

r = radius, d = diameter.

Area of a circle

$$A = \pi r^2$$

Use the radius, not the diameter.

Pythagoras

$$a^2 + b^2 = c^2$$

c is the hypotenuse in a right-angled triangle.

Right-angle trigonometry

$$\sin \theta = \text{opposite} \div \text{hypotenuse}$$

$$\cos \theta = \text{adjacent} \div \text{hypotenuse}$$

$$\tan \theta = \text{opposite} \div \text{adjacent}$$

SOH-CAH-TOA helps you choose the correct ratio.

Compound interest

$$\text{Total} = P(1 + r/100)^n$$

P = starting amount, r = percentage rate per period, n = number of periods.

Probability union

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

Use when outcomes can overlap.

Speed, distance, time

$$\text{speed} = \text{distance} \div \text{time}$$

$$\text{distance} = \text{speed} \times \text{time}$$

$$\text{time} = \text{distance} \div \text{speed}$$

Check whether the question uses seconds, minutes or hours.

Density, mass, volume

$$\text{density} = \text{mass} \div \text{volume}$$

$$\text{mass} = \text{density} \times \text{volume}$$

Common in both GCSE Maths and Science.

MATHS HT

GCSE Maths Formulae - Higher Tier Additions

Higher Tier students should be confident using these formulae in multi-step geometry, algebra and probability questions.

Quadratic formula

HT

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

For $ax^2 + bx + c = 0$, where $a \neq 0$.

Sine rule

HT

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Use with non-right-angled triangles when you know an opposite side-angle pair.

Cosine rule

HT

$$a^2 = b^2 + c^2 - 2bc \cos A$$

Use with SAS or SSS triangles.

Area of any triangle

HT

$$A = \frac{1}{2}ab \sin C$$

Use when you know two sides and the included angle.

Independent events

HT

$$P(A \text{ and } B) = P(A) \times P(B)$$

Only use this simplified version when events are independent.

Conditional probability

HT

$$P(A \text{ and } B) = P(A \text{ given } B) \times P(B)$$

Useful for tree diagrams, Venn diagrams and probability tables.

Gradient of a line

$$m = \frac{\text{change in } y}{\text{change in } x}$$

A positive gradient rises left to right; a negative gradient falls.

Straight line graph

$$y = mx + c$$

m = gradient, c = y-intercept.

Arc length

Often HT

$$\text{arc} = \frac{\theta}{360} \times 2\pi r$$

Use when the angle θ is in degrees.

Sector area

Often HT

$$\text{sector area} = \frac{\theta}{360} \times \pi r^2$$

Remember to use the radius, not the diameter.

MATHS SKILLS

GCSE Maths Essentials Students Still Need

Some formulae are not always presented on the official sheet, but students still use them in exam questions. Keep this page close during revision.

Percentage change

$$\text{percentage change} = (\text{change} \div \text{original}) \times 100$$

Use original value as the denominator.

Reverse percentage

$$\text{original} = \text{final} \div \text{multiplier}$$

Example: after 20% increase, multiplier = 1.20.

Mean

$$\text{mean} = \text{total} \div \text{number of values}$$

Check whether grouped data needs midpoints.

Range

$$\text{range} = \text{highest} - \text{lowest}$$

Spread measure; do not confuse it with IQR.

Pressure

$$\text{pressure} = \text{force} \div \text{area}$$

Also appears in physics calculations.

Direct proportion

$$y = kx$$

k is the constant of proportionality.

Inverse proportion

$$y = k/x$$

As x increases, y decreases.

Circle sector fraction

$$\text{fraction of circle} = \text{angle} \div 360$$

Use with area, circumference and pie charts.

Surface area of cuboid

$$SA = 2lw + 2lh + 2wh$$

Add the areas of all six faces.

Volume of cylinder

$$V = \pi r^2 h$$

A cylinder is a prism with a circular cross-section.

PHYSICS

GCSE Physics Equations - Energy, Power & Thermal

These equations cover the common GCSE Physics and Combined Science energy calculations. HT marks vary by exam board, so always check your specification.

Kinetic energy

$$E_k = \frac{1}{2}mv^2$$

m = mass (kg), v = speed (m/s), energy in joules (J).

Elastic potential energy

$$E_e = \frac{1}{2}ke^2$$

k = spring constant (N/m), e = extension (m).

Gravitational potential energy

$$E_p = mgh$$

g is gravitational field strength, usually 9.8 N/kg or 10 N/kg if stated.

Change in thermal energy

$$\Delta E = mc\Delta\theta$$

c = specific heat capacity, $\Delta\theta$ = temperature change.

Energy for change of state

$$E = mL$$

L = specific latent heat; no temperature change during state change.

Work done

$$W = Fs$$

Force and distance must be along the same line of action.

Power from energy

$$P = E \div t$$

P = watts (W), E = joules (J), t = seconds (s).

Power from work done

$$P = W \div t$$

Use when work done is given instead of energy transferred.

Efficiency using energy

$$\text{efficiency} = \frac{\text{useful output energy}}{\text{total input energy}} \div$$

Multiply by 100 for a percentage.

Efficiency using power

$$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}} \div$$

Keep both values in the same unit.

PHYSICS

GCSE Physics Equations - Electricity & Magnetism

Before substituting values, convert mA to A, k Ω to Ω , minutes to seconds and kWh to joules only if the question requires it.

Charge flow

$$Q = It$$

Q = charge (C), I = current (A), t = time (s).

Potential difference

$$V = IR$$

Ohm's law for potential difference, current and resistance.

Electrical power

$$P = VI$$

P = power (W), V = potential difference (V), I = current (A).

Power with resistance

$$P = I^2R$$

Useful when current and resistance are given.

Energy transferred

$$E = Pt$$

Energy in joules when power is in watts and time is in seconds.

Electrical energy

$$E = QV$$

Use charge flow and potential difference.

Transformer relationship

HT

$$V_p I_p = V_s I_s$$

Primary input power equals secondary output power for an ideal transformer.

Magnetic motor effect

HT

$$F = BIl$$

Force on a current-carrying conductor at right angles to a magnetic field.

Cost of electricity

$$\text{cost} = \text{power (kW)} \times \text{time (h)} \times \text{price per kWh}$$

Check whether power is given in W or kW.

Energy in kWh

$$\text{energy (kWh)} = \text{power (kW)} \times \text{time (h)}$$

Often used in domestic electricity questions.

PHYSICS

GCSE Physics Equations - Forces, Motion, Matter & Waves

Motion questions often need more than one equation. Write the known values first, then choose the formula that contains the unknown.

Density

$$\rho = m \div V$$

ρ = density, m = mass, V = volume.

Weight

$$W = mg$$

W = weight (N), m = mass (kg), g = gravitational field strength.

Distance travelled

$$s = vt$$

s = distance, v = speed, t = time.

Acceleration

$$a = \Delta v \div t = (v - u) \div t$$

u = initial velocity, v = final velocity.

SUVAT-style motion

Often HT

$$v^2 - u^2 = 2as$$

Useful when time is not given.

Resultant force

$$F = ma$$

Newton's second law: force = mass \times acceleration.

Momentum

HT

$$p = mv$$

p = momentum (kg m/s), m = mass, v = velocity.

Force and momentum

HT

$$F = \Delta p \div \Delta t$$

Use for collisions, impact time and safety features.

Pressure

$$p = F \div A$$

p = pressure, F = force, A = area.

Pressure in a fluid

Physics

$$p = h\rho g$$

h = height/depth, ρ = density, g = gravitational field strength.

Wave speed

$$v = f\lambda$$

v = wave speed, f = frequency, λ = wavelength.

Wave period

$$T = 1 \div f$$

T = time for one wave/oscillation.

CHEMISTRY

GCSE Chemistry Calculation Formulae

Chemistry calculation questions reward a clear method: balance the equation, convert units, use ratios, then round to a sensible number of significant figures.

Relative formula mass

M_r = sum of all A_r values in the formula

Multiply each element by the number of atoms shown.

Moles from mass

$n = m \div M_r$

n = amount in mol, m = mass in grams.

Mass from moles

$m = nM_r$

Rearranged from $n = m \div M_r$.

Concentration by mass

concentration = mass \div volume

Usually g/dm^3 . Convert cm^3 to dm^3 by dividing by 1000.

Concentration in mol/dm^3

HT

$c = n \div V$

V must be in dm^3 .

Moles in solution

HT

$n = cV$

Use when c is mol/dm^3 and V is dm^3 .

Gas volume at RTP

HT

volume = moles \times 24 dm^3

One mole of gas occupies 24 dm^3 at room temperature and pressure.

Percentage yield

$\% \text{ yield} = (\text{actual yield} \div \text{theoretical yield}) \times 100$

Use the same units for both masses.

Atom economy

$\% \text{ atom economy} = (\text{M}_r \text{ of desired product} \div \text{total M}_r \text{ of reactants}) \times 100$

For balanced equations.

Percentage by mass

$\% \text{ by mass} = (\text{mass of element in compound} \div \text{M}_r \text{ of compound}) \times 100$

Use $A_r \times$ number of atoms for the element.

Rate of reaction

rate = quantity changed \div time

Quantity can be mass, volume, concentration or gas volume.

Chromatography R_f value

$R_f = \text{distance moved by substance} \div \text{distance moved by solvent}$

Both distances measured from the pencil baseline.

BIOLOGY

GCSE Biology Calculation Formulae

Biology calculations usually test practical skills, graphs and data handling. Make sure the units match before using a formula.

Magnification

$$\text{magnification} = \text{image size} \div \text{actual size}$$

Image and actual size must be in the same units.

Actual size

$$\text{actual size} = \text{image size} \div \text{magnification}$$

Convert mm, μm and nm carefully.

Image size

$$\text{image size} = \text{actual size} \times \text{magnification}$$

Useful when drawing scale diagrams.

Percentage change

$$\% \text{ change} = (\text{change} \div \text{original}) \times 100$$

Use final - original to find the change.

Rate

$$\text{rate} = \text{change} \div \text{time}$$

Common in enzyme, photosynthesis, transpiration and decomposition questions.

Surface area to volume ratio

$$\text{SA:V} = \text{surface area} \div \text{volume}$$

Large SA:V helps faster exchange.

Population estimate

$$\text{estimated population} = \text{mean number per quadrat} \times \text{total number of quadrats in area}$$

Use random sampling to reduce bias.

Area of clear zone

$$\text{area} = \pi r^2$$

Used for antibiotic/antiseptic inhibition zones.

Bacterial divisions

HT/Context

$$\text{number after } n \text{ divisions} = \text{starting number} \times 2^n$$

Only if the question gives binary fission/division information.

BMI

$$\text{BMI} = \text{mass (kg)} \div \text{height}^2 \text{ (m}^2\text{)}$$

Can appear in health data questions, depending on board/context.

EXAM SKILLS

Units, Prefixes & Calculator Checks

Many correct methods lose marks because of unit mistakes. This page is designed to stop that.

Metric length

$$1 \text{ km} = 1000 \text{ m}$$

$$1 \text{ m} = 100 \text{ cm} = 1000 \text{ mm}$$

$$1 \text{ mm} = 1000 \mu\text{m}$$

Convert before using formulae.

Volume

$$1 \text{ m}^3 = 1,000,000 \text{ cm}^3$$

$$1 \text{ dm}^3 = 1000 \text{ cm}^3$$

$$1 \text{ cm}^3 = 1 \text{ mL}$$

Chemistry often uses cm^3 and dm^3 .

Time

$$1 \text{ min} = 60 \text{ s}$$

$$1 \text{ h} = 3600 \text{ s}$$

Physics equations usually use seconds.

Mass

$$1 \text{ kg} = 1000 \text{ g}$$

$$1 \text{ g} = 1000 \text{ mg}$$

Chemistry moles usually use grams.

Power and energy

$$1 \text{ kW} = 1000 \text{ W}$$

$$1 \text{ kWh} = 3.6 \times 10^6 \text{ J}$$

Useful in electricity cost questions.

Common prefixes

$$\text{kilo (k)} = \times 1000$$

$$\text{milli (m)} = \div 1000$$

$$\text{micro } (\mu) = \div 1,000,000$$

$$\text{nano (n)} = \div 1,000,000,000$$

Write numbers in standard form when very large/small.

Rounding

answer should match question accuracy

Use significant figures when data is given that way.

Substitution layout

formula values inserted answer + unit

This simple layout can protect method marks.

Calculator check

After you calculate, ask: Does the answer make physical sense? Are units correct? Did I use radius rather than diameter? Did I convert cm^3 to dm^3 ? Did I round too early?

REVISION PLAN

GCSE 2026 Formula Revision Checklist

Use this checklist for independent study, tuition sessions or as a downloadable website lead magnet.

I can choose the correct formula from a worded problem.
I know what every symbol in each formula means.
I can rearrange formulae before substituting values.
I can convert cm^3 to dm^3 , minutes to seconds and grams to kilograms.
I can use Pythagoras and trigonometry without mixing up sides.
I can use the quadratic formula accurately on a calculator.

I can identify Higher Tier equations before practice.
I can write formula, substitution, answer and unit on separate lines.
I can explain when a result is too big or too small.
I can use this sheet with past-paper questions, not just read it.
I have checked the official exam board sheet for my exam.
I know I cannot bring my own formula sheet into the exam room.

Suggested 30-minute formula routine

10 minutes: cover and recall key formulae. 15 minutes: complete 4-6 exam-style questions using this sheet. 5 minutes: mark mistakes and add them to your Red/Amber/Green list.

Need structured help?

RS Remote Tutoring supports GCSE students with online tuition, revision planning, topic support and past-paper practice.

NOTES

Source Notes & Student Disclaimer

What this PDF is based on

This student revision sheet was created using current public guidance and official exam board materials available at the time of preparation. It summarises high-value GCSE Maths and Science formulae in an original RS Remote Tutoring layout.

Source	What was checked
Ofqual / GOV.UK decision	GCSE Mathematics formulae sheets and GCSE Physics/Combined Science equation sheets are required for current specifications, with clean copies provided in exam papers and questions not answerable by copying only.
AQA 2026 update	AQA confirms 2026 formulae/equation sheets are available and the 2026 content matches the 2025 versions for revision and exam practice.
OCR 2026 update	OCR confirms separate Foundation and Higher Maths formulae sheets, clean printed copies, and revised Physics/Combined Science equation sheets for 2026.
Pearson Edexcel exam support	Pearson confirms GCSE Maths students receive an exam aid in the exam room and students must not bring their own copy into the exam.
AQA GCSE Chemistry and Biology specifications	Quantitative Chemistry and Biology maths/calculation skills were cross-checked for supporting GCSE calculation formulae.

Disclaimer

This is not an official exam board document. GCSE specifications, exam aids and Higher/Foundation tier requirements can differ by exam board. Students should always follow the official sheet and instructions issued by their school, centre and awarding body for their exact exam.

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