

How to get a grade 7 in AQA GCSE Physics (Higher tier)

A grade 7 needs everything in the grade 5 plan plus the Higher-tier-only content, multi-step calculations, confident rearranging and standard form, and 6-mark answers that regularly reach Level 3. Most marks lost at this grade come from slips and loose wording rather than not knowing the physics, so this plan gives as much weight to exam practice and strict marking as to learning. It covers 10 weeks at 4 to 5 hours of physics a week.

What a grade 7 asks of you

- All the grade 5 content, plus the Higher-only parts of the specification, such as momentum, Fleming's left-hand rule and $F = BIL$, the generator effect and transformers, pressure at depth in a liquid, tangents to distance–time graphs and the area under a velocity–time graph.
- Multi-step calculations that link two or three equations, e.g. $E = Pt$ with $\Delta E = mc\Delta\theta$, $mgh = \frac{1}{2}mv^2$ to find a speed, or $v^2 - u^2 = 2as$ then $F = ma$, with standard form and prefixes.
- Explanations in terms of particles, fields or energy, written as a logical chain with no missing steps.
- Analysis of data from investigations you haven't seen before: uncertainty, precision and accuracy, anomalies, and specific improvements.
- 6-mark answers that are detailed, logically ordered and cover every part of the question.

Secure these topics first

- Every equation, recall and sheet, with units, until you can rearrange any of them quickly.
- Paper 1 topics that produce multi-step questions: specific heat capacity and specific latent heat (including heating and cooling graphs), electrical power and energy ($P = I^2R$, $E = QV$), efficiency, the density of irregular objects, the fraction of a sample left after several half-lives, and gas pressure ($pV = \text{constant}$, and why doing work on a gas raises its temperature).
- Paper 2: momentum, its conservation, and force as rate of change of momentum; $v^2 - u^2 = 2as$; braking forces and deceleration; resultant forces by scale drawing; moments, levers and gears; $F = BIL$, electric motors, the generator effect and transformers; refraction explained with wave fronts, sound and ultrasound; lenses and magnification; black body radiation; orbital motion and red-shift.
- The analysis side of each required practical: the spring constant from the gradient of a force–extension graph, the specific heat capacity from the gradient of a temperature–energy graph ($c = 1 \div (m \times \text{gradient})$), wave speed from $v = f\lambda$, and density from mass and volume.

Question types to master

- Multi-step and 'show that' calculations, with the answer to the significant figures asked for.
- Rearranging equations with squares and square roots: $E_k = \frac{1}{2}mv^2$ for v , $v^2 - u^2 = 2as$ for u , $P = I^2R$ for I .
- Gradients with units, tangents to curves and areas under velocity–time graphs.
- 3 to 4 mark explanations that chain ideas, e.g. why the pressure of a gas in a sealed container rises when it is heated.
- 6-mark method and explanation questions at Level 3, and 'evaluate' questions that end in a justified conclusion.
- Questions set in unfamiliar contexts, where the first job is to spot which physics applies.

Your 10-week revision plan

- Week 1: Energy and the Particle model, including every heating calculation ($\Delta E = mc\Delta\theta$, $E = mL$, heating and cooling graphs), energy resources and gas pressure.
- Week 2: Electricity: circuits, I–V graphs, series and parallel, power and energy, mains, the National Grid, static and electric fields.
- Week 3: Atomic structure, including nuclear equations, half-life calculations, the development of the model of the atom, and fission and fusion. Finish with a timed Paper 1 mock.
- Week 4: Forces: vectors, resultants and scale drawings, work done, springs (including $E_e = \frac{1}{2}ke^2$), moments, levers and gears, pressure in fluids and upthrust.
- Week 5: Motion and momentum: motion graphs (gradients, tangents, areas), $v^2 - u^2 = 2as$, Newton's laws, stopping distances and momentum.
- Week 6: Waves: sound, ultrasound and seismic waves, electromagnetic waves, refraction, lenses, visible light and black body radiation.
- Week 7: Magnetism and electromagnetism (motor effect, $F = BIL$, generator effect, transformers) and Space physics. Finish with a timed Paper 2 mock.
- Week 8: all 10 required practicals: method, analysis, uncertainty and evaluation for each.
- Week 9: your weakest subtopics from Progress, then a second timed Paper 1 mock.
- Week 10: a second timed Paper 2 mock, redo every dropped mark, and rewrite any 6-mark answer that didn't reach Level 3.

How to use GCSE Paper Builder

- Notes: work through the grade-by-grade skill lists up to grade 7 and tick each skill off in the checklist. Use each subtopic's worksheet to test yourself before moving on, and its cheatsheet for quick reviews.
- Custom paper: set Medium and Hard difficulty on the week's subtopics. Once you're scoring well, add Extreme questions and mix subtopics from different topics so you practise recognising the physics.
- Mock exams: sit four timed mocks (weeks 3, 7, 9 and 10) and mark them strictly with the mark scheme.
- Progress: after every paper, start with your weakest subtopics and redo each question you dropped marks on.
- Daily 5 and Flashcards: a few minutes every day on the facts, equations and definitions that trip you up.
- Whiteboard: set out multi-step calculations and sketch graphs or ray diagrams on screen before committing to an answer.
- Exam technique guide (in Notes): reread the sections on calculations and 6-mark answers before each mock.
- Tutoring: if your 6-mark answers keep stalling at Level 2, a 1-to-1 lesson with Chhetri Academy can show you exactly what is missing; the first 30-minute trial lesson is free.

Timing strategy in the exam

- Aim to finish at about 95 minutes, working at just under a minute per mark, which leaves 10 minutes to check.
- Plan each 6-mark answer for a minute before you write, and give it 7 to 8 minutes in total.
- In a long calculation, always write the equation and substitution even if you're short of time: they carry marks.
- Move on from any part that has taken twice its marks in minutes, and come back to it at the end.

Traps at grade 7

- Squares: only v is squared in $\frac{1}{2}mv^2$; square the current first in $P = I^2R$; after rearranging $v^2 - u^2 = 2as$ for a speed, remember the square root.
- Area and volume conversions: $1 \text{ cm}^2 = 1 \times 10^{-4} \text{ m}^2$ and $1 \text{ cm}^3 = 1 \times 10^{-6} \text{ m}^3$. Dividing by 100 in both cases is a common slip.
- Momentum is a vector: in collision and explosion questions, give velocities in one direction a negative sign.
- Confusing accuracy with precision, or resolution with uncertainty.
- 6-mark answers that list facts without linking them, or methods that miss a step such as what is measured, with what, or how the results are used.
- Treating a 'show that' as done when your answer only matches after rounding. Show the more precise value.
- Rounding in the middle of a multi-step calculation, which can push your final answer out of the accepted range.

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