

AQA . YEAR 13 PREPARATION

Moving from AS to the Second Year of AQA A Level Physics

A practical guide to the jump from the first year of AQA Physics into the second-year core (sections 3.6-3.8) and your optional topic, with the new maths you need, worked examples and a realistic summer plan.

For Year 12 moving into Year 13

AQA 7408 . sections 3.6-3.8 + option

2-3 short sessions per week

Is the second year harder than the first?

For most pupils yes - mainly because it is more abstract and more maths-heavy, and the exams are synoptic.

FIRST-YEAR QUESTION

A capacitor stores a charge of 0.020 C at a potential difference of 8.0 V. Calculate its capacitance.

SECOND-YEAR QUESTION

A 2200 μF capacitor charged to 12 V discharges through a 47 k Ω resistor. Determine the time for the stored energy to halve, and explain why this differs from the time for the charge to halve.

What changes

- 1. Topics become more abstract
- 2. The maths steps up
- 3. Exams become synoptic, and you choose an option

The first-year topics to lock down before Year 13

Mechanics and materials

resultant force and Newton's laws, momentum and impulse, work, energy and power

Electricity

charge, current, p.d., resistance and circuits, energy and power in circuits

Particles and waves

particles, antiparticles and radiation, the photon model and quantum ideas, wave properties and superposition

Maths and practical skills

fluent rearrangement, standard form and units, graphs and uncertainties

Key skills to nail

- Work in RADIANS (not degrees) for circular motion and SHM.
- Use the angular links: $\omega = 2\pi f$, $v = \omega r$, $a = \omega^2 r$.
- Master exponential decay: $Q = Q_0 e^{-t/RC}$ and $N = N_0 e^{-\lambda t}$.
- Use e^x and \ln on your calculator; \ln turns an exponential into a straight line.
- Apply inverse-square laws: double the distance, quarter the field ($g = GM / r^2$).

Common mistakes to avoid

- Treating first-year content as finished
- Avoiding the new maths

- Neglecting definitions
- Leaving exam practice late

Your summer in 6 steps

Around 2-3 short sessions per week, each 30-45 minutes. The aim is warm first-year knowledge and the new maths in place.

- 1 Week 1: Refresh mechanics and maths fluency - The foundation for further mechanics, fields and thermal physics.
- 2 Week 2: Radians and circular motion - Get comfortable with radians before lessons begin.
- 3 Week 3: Exponentials, logs and log graphs - These underpin capacitors and nuclear decay.
- 4 Week 4: Overview of fields - A big-picture overview makes section 3.7 less intimidating.
- 5 Week 5: Capacitors and nuclear decay - Apply your new exponential maths.
- 6 Week 6: Synoptic work and your option - Practise pulling ideas together and look ahead to your option.

The new second-year topics (AQA, sections 3.6-3.8 + an option)

Sections 3.6-3.8 are the new core second-year content. You will also study one optional topic (3.9-3.13) for Paper 3. Tick what you feel confident about.

- 3.6 Further mechanics and thermal physics**
3.6.1 Periodic motion - 3.6.2 Thermal physics
- 3.7 Fields and their consequences**
3.7.1 Fields - 3.7.2 Gravitational fields - 3.7.3 Electric fields - 3.7.4 Capacitance - 3.7.5 Magnetic fields
- 3.8 Nuclear physics**
3.8.1 Radioactivity
- Optional topics (choose one for Paper 3, Section B)**
3.9 Astrophysics - 3.10 Medical physics - 3.11 Engineering physics - 3.12 Turning points in physics - 3.13 Electronics

Questions pupils ask

Is the second year of AQA Physics harder than the first?

For most pupils yes, because the new core (sections 3.6-3.8) is more abstract, the maths steps up to radians, exponentials and natural logs, and the exams are synoptic. Strong first-year foundations make it far more manageable.

What should I revise before Year 13 AQA Physics?

Lock down mechanics, electricity, particles and your maths fluency. Further mechanics builds on mechanics; fields build on electricity; nuclear physics builds on particles and radiation.

What new maths do I need for the AQA second year?

Radians and angular quantities, exponential functions, natural logarithms, log-linear graphs and inverse-square laws. You must use e and \ln confidently on your calculator.

Where to practise: join PhysicsUK

This guide gets you ready. PhysicsUK is where you practise the skills and prove you can do them:

- ExamBOT - exam-style papers marked instantly with feedback
- ProblemBOT - multi-step problems with full worked solutions
- QWC - written answers marked against the mark scheme
- MCQ quizzes and a daily question to keep knowledge warm
- Track your progress and target your weakest topics

Try it free as a guest, then become a member to unlock full practice, save your progress and see what you can achieve.

Start now at www.physicsuk.co.uk

Read the full interactive guide (quizzes, trainers and audio) at:

www.physicsuk.co.uk/aqa-a-level-physics-as-to-a-level-transition-guide