OCR A (H556) . YEAR 13 PREPARATION

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

A practical guide to the jump from the first year of OCR A Physics into Modules 5 and 6, with the new maths you need, the topics ahead, worked examples and a realistic summer plan.

For Year 12 moving into Year 13 | OCR A H556 Modules 5-6 | 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 uF capacitor charged to 12 V discharges through a 47 k ohm 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

The first-year topics to lock down before Year 13

Mechanics
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

Waves and quantum
wave properties and superposition, the photon model, photoelectric effect

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 = Q0 e^(-t/RC) and N = N0 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 circular motion, SHM and fields.
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 Module 5 fields less intimidating.
5. Week 5: Capacitors and nuclear decay - Apply your new exponential maths.
6. Week 6: Synoptic problem solving - Practise pulling ideas together.

The new second-year topics (OCR A, Modules 5-6)

These topics are brand new in the second year of OCR A Physics. Tick the ones you feel confident you understand the maths behind - the rest are your summer and Year 13 priorities.

- ☐ **Module 5: Newtonian World & Astrophysics**
  5.1 Thermal physics - 5.2 Circular motion - 5.3 Oscillations (SHM) - 5.4 Gravitational fields - 5.5 Astrophysics & cosmology
- ☐ **Module 6: Particles & Medical Physics**
  6.1 Capacitors - 6.2 Electric fields - 6.3 Electromagnetism - 6.4 Nuclear & particle physics - 6.5 Medical imaging (e.g., ultrasound)

Questions pupils ask

Is the second year of OCR A Physics harder than the first?
For most pupils yes, because Modules 5 and 6 are 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 OCR A Physics?
Lock down mechanics, electricity and your maths fluency. Circular motion, SHM and gravitational fields build on mechanics; capacitors and fields build on electricity.

What new maths do I need for Modules 5 and 6?
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.

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

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