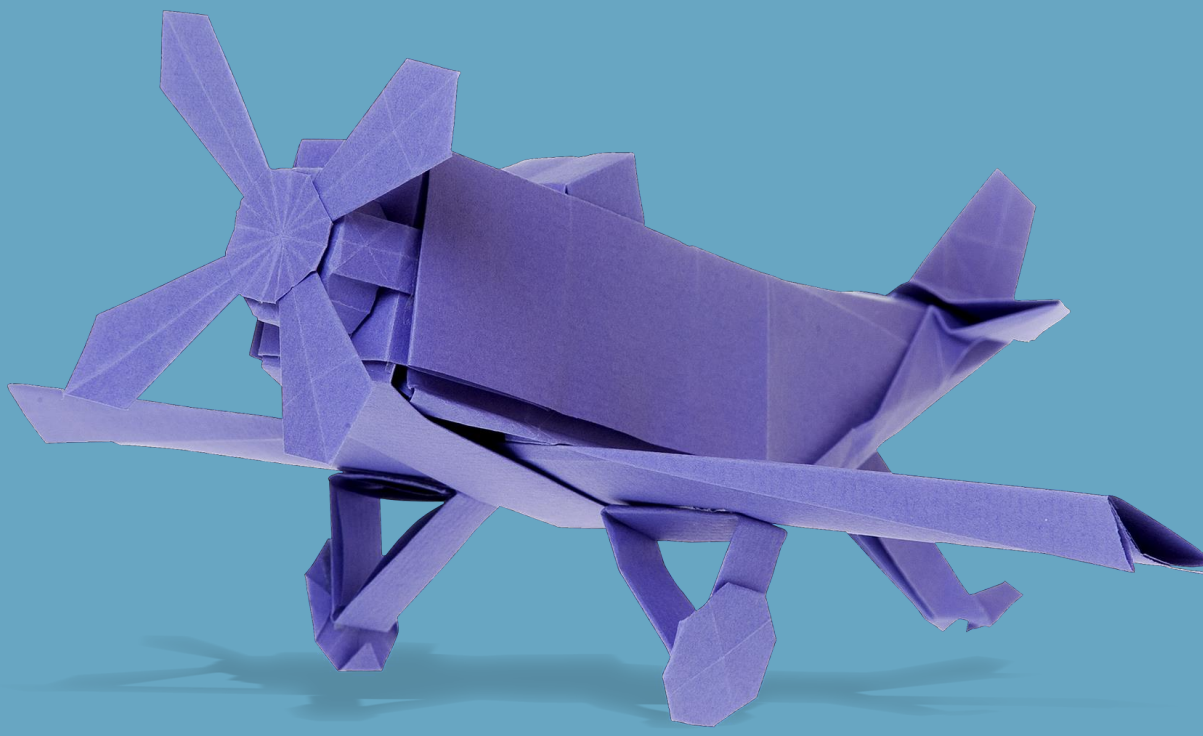
Pearson Edexcel

A level Physics

Switching from AQA Physics to Edexcel Physics



AS AND A LEVEL PHYSICS

Switching from AQA to Edexcel

This document is designed to help you compare the 2015 AQA Physics specification with the 2015 Edexcel Physics specification.

The document gives an overview, at the topic level, of where the material covered in the AQA Physics specification can be found in the Edexcel Physics specification. The following tables then give a more detailed breakdown of the AQA and Edexcel specifications, and highlight areas of difference. These will help you see where material that you currently teach in the AQA specification is not present in the Edexcel specification; or where the Edexcel specification incorporates material that is new to you.

As a general overview, the 2015 Edexcel Physics specification is split into a number of topics. At AS, these topics are: Working as a Physicist; Mechanics; Electric Circuits; Materials; and Waves and the Particle Nature of Light. In the second year of the A level, the topics are: Further Mechanics; Electric and Magnetic Fields; Nuclear and Particle Physics; Thermodynamics; Space; Nuclear Radiation; Gravitational Fields; and Oscillations.

The biggest difference is that there are five option topics in the AQA specification, of which students study just one. Some of the content of three of these options is in the Edexcel specification.

The course can also be taught using a context-led approach, as exemplified by the Salters Horners (SHAP) approach. This approach considers applications that draw on areas of physics, and moves on to the underlying laws, theories and models of physics. Both the SHAP approach and the concept approach to the specification involve the same specification statements at AS and A level, but the SHAP approach groups these statements into topics in a different way.

As well as great physics within the specification, there are other ways in which we can help support your teaching of our A level Physics specification. Our free support includes:

- additional sets of question papers
- Results Plus, now with Mock Analysis service
- Exam Wizard, our online bank of past paper questions
- documents to help deliver the mathematics and practical aspects of the specification
- worksheets for each Core Practical in the specification.

Overview of content

AQA Physics	Edexcel Physics
AS level content	
3.1 Measurements and their errors	Topic 1: Working as a Physicist and core practicals
3.2 Particles and radiation	
3.2.1 Particles	Topic 8: Nuclear and Particle Physics 130, 135–138, 140, 141, 142, 143 Topic 11: Nuclear Radiation 170 Topic 5: Waves and Particle Nature of Light 60, 91
3.2.2 Electromagnetic radiation and quantum phenomena	Topic 5: Waves and Particle Nature of Light 86, 87, 92–96
3.3 Waves	Topic 5: Waves and Particle Nature of Light 59–63, 65–68, 71–74, 82–85
3.4 Mechanics and materials	
3.4.1 Force, energy and momentum	Topic 2: Mechanics 9–17, 20–30
3.4.2 Materials	Topic 4: Materials 49, 53–58
3.5 Electricity	
3.5.1 Current electricity	Topic 3: Electric Circuits 31– 39, 42–48
A level content	
3.6 Further mechanics and thermal physics	
3.6.1 Periodic motion	Topic 6: Further Mechanics 103–107 Topic 13: Oscillations 181–190
3.6.2 Thermal physics	Topic 9: Thermodynamics 144–152
3.7 Fields and their consequences	
3.7.2 Gravitation fields	Topic 2: Mechanics 18 Topic 12: Gravitational Fields 174–180
3.7.3 Electric fields	Topic 7: Electric and Magnetic Fields 108–115
3.7.4 Capacitance	Topic 7: Electric and Magnetic Fields 116–120
3.7.5 Magnetic fields	Topic 7: Electric and Magnetic Fields 121–127 Topic 8: Nuclear and Particle Physics 133–134
3.8 Nuclear physics	Topic 8: Nuclear and Particle Physics 131 Topic 11: Nuclear Radiation 164–173

Students also study one of the following five options	
Option 1 **3.9 Astrophysics**	
3.9.1 Telescopes	Topic 5: Waves and Particle Nature of Light 75, 76, 80, 81 NB optical telescopes only
3.9.2 Classification of stars	Topic 10: Space 156, 158–160 Topic 9: Thermodynamics 153–155
3.9.3 Cosmology	Topic 10: Space 161–163
Option 2 **3.10 Medical physics**	
3.10.1 Physics of the eye	Topic 5: Waves and Particle Nature of Light 77, 78, 80, 81
3.10.2 Physics of the ear	N/A
3.10.3 Biological measurement	N/A
3.10.4 Non-ionising imaging	Topic 5: Waves and Particle Nature of Light 72, 73, 88, 89
3.10.5 X-ray imaging	N/A
3.10.6 Radionuclide imaging and therapy	N/A
Option 3 **3.11 Engineering physics**	
3.11.1 – 3.11.2	N/A
Option 4 **3.12 Turning points in physics**	
3.12.1 The discovery of the electron	Topic 8: Nuclear and Particle Physics 132–134 Topic 4: Materials 51
3.12.2 Wave-particle duality	Topic 5: Waves and Particle Nature of Light 86, 87, 90–93, 95
3.12.3 Special relativity	N/A
Option 5 **3.13 Electronics**	
3.13.1 – 3.13.6	N/A

In-depth comparison

AQA Physics	Edexcel Physics	What's new for you	What you no longer teach
Section 1: Measurements and their errors	Topic 1: Working as a Physicist Core practicals	This topic is not intended to be taught as a discrete topic. The knowledge and skills specified here should pervade the entire course.	
Section 2: Particles and radiation	Topic 8: Nuclear and Particle Physics 130, 135–143 Topic 5 Waves and the Particle Nature of Light 83–87, 90–96	✓ 135 – be able to apply conservation of charge, energy and momentum to interactions ✓ between particles and interpret particle tracks ✓ 136– understand why high energies are required to investigate the structure of nucleons ✓ 137 – be able to use the equation $\Delta E = c2\Delta m$ in situations involving the creation and annihilation of matter and antimatter particles ✓ 138 – be able to use MeV and GeV (energy) and MeV/c^2, GeV/c^2 (mass) and convert between these and SI units ✓ 139 – understand situations in which the relativistic increase in particle lifetime is significant	✓ The strong nuclear force ✓ Non-conservation of strangeness in the weak interaction ✓ Stable and unstable nuclei ✓ Particle interactions ✓ Strong and weak interactions ✓ Inverse square law for gamma radiation ✓ Nuclear instability ✓ Nuclear radius ✓ Nuclear reactors – induced fission operations and safety

AQA Physics	Edexcel Physics	What's new for you	What you no longer teach
Section 3: Waves	Topic 5: Waves and Particle Nature of Light 59–82, 88–89	✓ 65 – know and understand what is meant by wavefront ✓ 66 – be able to use the relationship between phase difference and path difference ✓ 70 – be able to use the equation intensity of radiation I = P/A ✓ 74 – understand how to measure the refractive index of a solid material ✓ 75–81 – geometric optics	✓ Young's double split experiment ✓ Derivation of $d\sin\theta = n\lambda$
Section 4: Mechanics and materials	Topic 2: Mechanics 9–30	✓ 12 – recognise vector notation ✓ 14 – find the resultant of two coplanar vectors at any angle to each other ✓ 24 – apply the principle of moments to an extended body in equilibrium ✓ 22 – understand how to relate the principle of conservation of linear momentum to Newton's laws of motion	
	Topic 4: Materials 49–58	✓ 50 – understand how to use the relationship upthrust = weight of fluid displaced ✓ 51 – understand that Stokes' Law* applies only to small spherical objects moving at low speeds with *laminar flow* (or in	* NB Stokes' Law is covered in Option 3 (Turning Points)

AQA Physics	Edexcel Physics	What's new for you	What you no longer teach
		the absence of *turbulent flow*) and that viscosity is temperature dependent ✓ 52 – use a falling-ball method to determine the viscosity of a liquid	
Section 5: Electricity	Topic 3: Electric circuits 31–48	✓ 36 – be able to derive the equations for combining resistances in series and parallel ✓ 41 – be able to use $I = nqvA$ to explain the large range of resistivities of different materials ✓ 48 – understand how changes of resistance with illumination may be modelled in terms of the number of conduction electrons and understand how to apply this model to LDRs	✓ Superconductivity ✓ Applications of superconductors
Section 6: Further Mechanics and thermal physics	Topic 6: Further mechanics Topic 13: Oscillations	✓ 99 – understand how to apply conservation of linear momentum to problems in two dimensions ✓ 102 – be able to derive and use the equation relating the momentum and kinetic energy of a non-relativistic particle ✓ 105 – be able to use vector diagrams to derive the equations for centripetal acceleration	

AQA Physics	Edexcel Physics	What's new for you	What you no longer teach
	Topic 9: Thermodynamics 144–152	✓ 149 – be able to derive and use the equation $pV = 1/3\ Nm\langle c^2 \rangle$ ✓ 152 – be able to derive and use the equation $½\ m\langle c^2 \rangle = 2/3\ kT$	✓ Gas laws ✓ Molar mass and molecular mass ✓ Continuous flow calculations
Section 7: Fields and their consequences	Topic 12: Gravitational Fields Topic 7: Electric and Magnetic Fields Topic 8: Nuclear and Particle Physics 133, 134		✓ V related to g by $g = \Delta V/\Delta r$ ✓ ΔV from area under graph of g against r ✓ Deriving $T^2 \propto r^3$ ✓ Plane and radius of geostationary orbits ✓ Work done as mass times change in potential, relation between field strength and potential gradient ✓ V related to E by $E = \Delta V/\Delta r$ ✓ ΔV from area under graph of E against r ✓ Dielectric action of a capacitor ✓ Polar molecules ✓ The transformer ✓ Transformer efficiency ✓ Production of eddy currents ✓ Causes of inefficiencies in a transformer
Section 8: Nuclear Physics	Topic 8: Nuclear and Particle Physics 131, 137		✓ Calculations involving molar mass and Avogadro constant

AQA Physics	Edexcel Physics	What's new for you	What you no longer teach
	Topic 11: Nuclear Radiation		✓ Nuclear radius $R = R_0 A^{1/3}$ ✓ Nuclear density ✓ Graph of intensity against angle for electron diffraction ✓ Chain reactions, critical mass ✓ Moderators, control rods and coolants in reactors
AQA students study ONE of the following five topics. There is no option choice in the Edexcel specification, but some of the AQA content does appear in the Edexcel specification. The Edexcel specification contains material from across three of the AQA option topics.			
Section 9: Astrophysics	Topic 5: Waves and Particle Nature of Light75–81 (lenses) Topic 9: Thermodynamics 153–155 (Black bodies, Stefan and Wien's laws) Topic 10: Space	✓ 157 – Use of trigonometric parallax	✓ Non optical telescopes ✓ Classification of stars by luminosity ✓ Use of stellar spectral classes ✓ The detail of supernovae and black holes ✓ quasars and exoplanets
Section 10: Medical Physics	Topic 5: Waves and Particle Nature of Light 75–81, 88–89		✓ Structure and sensitivity of the eye ✓ Rods and cones ✓ Defects of vision and correction ✓ Physics of the ear ✓ Biological measurement (ECG) ✓ Ultrasound, fibre optics, endoscopy, MR scanning ✓ X-ray imaging ✓ Radionuclide imaging and therapy

AQA Physics	Edexcel Physics	What's new for you	What you no longer teach
Section 11: Engineering physics			✓ All of this topic
Section 12: Turning Points in Physics	Topic 8: Nuclear and particle physics 131, 137 (thermionic emission) Topic 5: Waves and particle nature of light 86 -87, 90–92		✓ Electron microscopes ✓ Special relativity ✓ Einstein's theory of special relativity
Section 13: Electronics			✓ All of this topic