Pearson Edexcel GCE Physics

Switching from AQA to Edexcel: Practical guidance

Contents

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Practical guidance

This document provides guidance for teaching the practical aspects of the Edexcel Physics specification.

Edexcel suggests blending practical activities with theoretical learning throughout the course to help students systematically build their skills. The syllabus can be laid out to follow the "Salters Horners" spiral curriculum, which revisits key ideas and ties physics to everyday situations or the concept-based approach. Both the Salter Horners approach and concept-based, address the same learning objectives at AS and A level, but they arrange topics differently.

While the Salters approach may seem initially complex due to its division of topics, it is valuable as it enables learners to move from basic ideas to deeper understanding, teachers can also use a *mix of approaches* (context-led and concept-led). This document also demonstrates how standard AQA practicals fit into the Edexcel framework and provides tables listing relevant experiments and set pieces.

Most AQA practicals are applicable to Edexcel, allowing teachers flexibility to use their preferred investigations.

Transitioning from AQA to Edexcel

- Invest some time in the practical activity for Edexcel. There is no need to do them all, but you could start with one per term as a manageable amount.
- Apart from the practical activity, consider using your normal practicals for the first year.
- Evaluate how effectively your normal practicals fit with the set pieces (practical activity in physics).

Top tips

- Look at the final synoptic examination papers to get a feel for the way practical Physics is assessed.
- Decide whether to use the concept or context lead approach or both.
- Look at the suggested practicals in this document and decide which ones you want to try.

Finally remember that you can structure and teach the course as you see fit. Apart from the Hall probe, Youngs Double Slit, and Making a Capacitor, ***all the practical science you have used for AQA will be useful for the teaching of Edexcel.***

For further details on equipment, please see our list of equipment and techniques.

General Overview

Topic (AQA)	Suggested Changes (Edexcel)
1. Measurements and their errors	Delivered continuously instead of in separate modules.
2. Particles and radiation	Practicals remain similar, with the topic contextualised through PRO (A2), MUS (laser in a CD player), and SPC (solar panels).
3. Waves	Practicals remain similar. There is increased use of oscilloscopes, and waves in pipes is recommended. Waves can be contextualised with the MUS module for wave properties and the EAT topic for optics, which includes polarimetry of a sugar solution.
4. Mechanics and materials	Almost all practicals are the same. Motion is contextualised via the Olympics with HFS. Materials are split between EAT (density, upthrust, viscosity of sweets/honey) and SUR (body-part replacement including YM of crunchy bars, and lenses.
5. Electricity	Circuits can be contextualised via the circuitry of satellites, and this includes I = P/A for solar panels. The internal resistance of a lemon cell makes an effective challenge.
6. Further mechanics and thermal physics (A-level only)	All AQA practicals are useful. This topic can be split into the circular motion of particle accelerators (PRO) and the application of SHM to earthquake-proof buildings (BLD). BLD includes the physics of central heating.
7. Fields and their consequences (A-level only)	All AQA practicals are useful. Fields can be split up via the context of MDM (types of screens) for electric fields, PRO (particle accelerators and detectors) for Coulomb's Law, and STA (stars) for g. Capacitance is used in the MDM topic. TRA (trains) is the context for revisiting force and momentum, as well as electromagnetism, with a focus on eddy current braking.
8. Nuclear physics (A-level only)	All AQA practicals are useful. This topic fits into the STA context via the history of the universe, and nucleosynthesis.
Options.	Astrophysics is a key part of the Edexcel specification. Medical Physics is included in SUR (lenses only). Turning points comes up in EAT (viscosity of honey), DIG (X-ray diffraction), MDM (electron gun), and PRO (alpha-scattering).

Comparison of practical activities

The GCE Physics specification integrates practical work within real-world contexts and frequently aligns with AQA in terms of available resources. Certain practical activities are distinguished by their unique approaches to illustrating key topics.

The comparison table is arranged by specification points, making it simple to compare with AQA. Using a context-driven format, concepts are distributed throughout different modules, allowing students to link theory with hands-on practice and return to topics during the year for deeper learning.

Edexcel Physics (2015) Title and spec points.	**AQA**	**What's new for you**	**What you no longer need.**
Topic 1: Working as a Physicist. (1 - 8)	1. Measurements and their errors	This module will be embedded in the content and no longer taught as a separate section. Embedding skills throughout the course means that they are revisited often, allowing for development.	Thickness of a molecule via oil drop.
Topic 2: Mechanics (9 - 30)	3.4.1 Mechanics	Optional context of the Olympics. Measurements of a sprint start (via tikkatape or video capture) Set Piece/practical activity: Ski-Jump Set Piece/practical activity: Bungee Jump *Analysing student's own data democratises the classroom and is extremely engaging. The ski-jump allows for a full investigation into the independence of the x and y components of velocity, whilst also providing an early opportunity to explore practical skills required for the CPAC.*	
Topic 3: Electrical Circuits (31 - 48)	3.5 Electricity	Optional context of technology in satellites (SPC) and archaeology (DIG) Set Piece/practical activity: resistive survey using teledeltos paper or similar; resistive putty. Suggested: emf of a Lemon cell *Teledeltos paper allows for "mystery" shapes to be investigated which provides a practical challenge while linking to the techniques used in real life archaeological discoveries.*	

Topic 4: Materials (49 - 58)	3.4 Materials. Option: Turning points	Optional context of sweets (EAT) and replacement body parts (SUR). Set piece/practical activity: falling ball viscometer (how runny is honey) Set piece/practical activity: YM of a crunchy bar (Crunchy bones). *This also links the GCSE topics of density and upthrust to the new concept of viscosity while introducing new experimental ideas (terminal velocity and micrometres).* *The Young Modulus of a crunchy bar is a delightful practical challenge. It is also a great opportunity to teach the combination of % uncertainties.*	
Topic 5: Waves and the Particle Nature of Light (59 - 96)	3.3 Prog. and Stat. waves	Optional contest: music (MUS), optics of sugar solutions (EAT), spectacles (SUR), X-ray diffraction (DIG) Use of oscilloscope is required. Suggested: microwave model cd; waves in pipes. Set piece/practical activity: power of a lens. Set piece/practical activity: refraction through sugar solution. Set piece/practical activity: polarimetry of sugar solution. Diffraction through a grating with a red and green laser. *The power of a diverging lens is an interesting practical challenge that reinforces the use of lenses in correcting eyesight.* *The properties of sugar solutions are fascinating; by varying the concentration, it helps students to understand refraction as there is a clear link to an increasing optical density.*	Young's Double Slit experiment.

Topic 6: Further Mechanics (97 - 107)	3.4 Force, Energy, Momentum. 3.6 Periodic motion	Optional context: train crumple zones (TRA); circular particle accelerators (PRO) Set piece: analysing the momentum of two colliding spheres in two dimensions. Set piece: car crumple-zone investigation *Combining the CPAC (2-d momentum) with particle physics makes the analysis of particle tracks much more concrete for the students and easier to understand.*	
Topic 7: Electric and Magnetic Fields (108 - 129)	3.7 Electric fields, Capacitance, magnetic fields	Optional context: screens (MDM), particle accelerators and detectors (PRO). Set piece/practical activity: the electron gun, and fine beam tube. Set piece/practical activity: eddy current braking. Set piece/practical activity charged balloons on a thread. Set piece/practical activity: mystery capacitor. *Seeing the electron beam tubes allows students to take actual measurements of things that would otherwise be totally abstract. Although only rudimentary measurements are possible, the strength of a school bar magnet can easily be identified.* *Eddy current braking is a very abstract concept, and these practicals demonstrate clearly that it is very much a real effect.* *Balloons on a thread allows several different concepts to be explored including a revision of vectors and equal and opposite forces.*	Search coil / Hall probe. Matchbox capacitor.
Topic 8: Nuclear and Particle Physics (130 - 143)	3.2 Particles. Option: Turning points.	Optional context: particle accelerators and detectors (PRO).	

		CERN utilises so many different areas of Physics that it provides a context for several different topics. Each idea builds on the last and is given a fresh impetus by being part of a larger picture - the Large Hadron Collider. Momentum, circular motion, Coulomb's Law, and conservation laws are all needed to build and interpret particle accelerators.	
Topic 9: Thermodynamics) (144 - 155)	3.6 Thermal Physics. Option: Astrophysics	Optional context: studying the stars. Set piece/practical activity: glowing metal.	
Topic 10: Space (156 - 163)	Option: Astrophysics	Set piece/practical activity: Bunsen's distance to the sun. Set piece/practical activity: Distance to the moon via eclipsing 5p *Observational astronomy provides valuable opportunities. Enabling students to calculate the distances to two nearby celestial bodies enhances their understanding of future measurements and offers additional practice in managing combined uncertainties.*	
Topic 11: Nuclear Radiation (164 - 173)	3.8 Radioactivity	Optional context: age of the solar system. CPAC: gamma penetration through lead.	Inverse-square law for gamma
Topic 12: Gravitational fields (174 - 180)	3.7 Gravitational fields	Optional context: binary orbits (STA)	
Topic 13: Oscillations (181 - 191)	3.6 Periodic motion	Optional context: earthquake-proof buildings (BLD) Set piece/practical activity: resonance e.g. resonating jelly. *This practical is a real "wow" moment but also has very specific links e.g. to the University of Bristol Earthquake table. Seeing a small version helps to imagine other contexts.*	

Get in touch!

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