Year 12 Physics classes are taught by 1 Physics specialist teacher. Through liason with the Maths department, effort is made to coincide teaching of key maths skills in both Maths and Physics. Core Practicals are delivered within the relevant topics to enhance knowledge, understanding and investigative skills and also provide evidence for the Practical Endorsement qualification. Mathematical skills are developed within topics also. Many topics in year 12 build upon foundation skills/knowledge from KS4 topics (Separate Physics codes in red).

		Autumn		Spring		Summer	
Year 12		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Knowledge	**Topic 1: Working as a Physicist -** essential knowledge and understanding of the conventions used in communicating and learning physics **Topic 2[1/8/9]: Mechanics parts 1 and 2 -** Motion with uniform acceleration including projectiles. Representing motion on graphs, and using mathematics	**Topic 2[2/3]: Mechanics parts 3 and 4 -** Newton's laws applied to explain motion, objects in equilibrium, moments, conservation of momentum and energy, work and power. **Topic 4[14/15]: Materials -** Hooke's Law, Stress, strain and Young Modulus, material behaviour represented on graphs, density, upthrust and viscosity.	**Topic 3[10/11/12/13]: Electric Circuits -** Q, I, V, R and resistivity, I-V characteristics, electrical energy and power, EMF and internal resistance, Conservation of charge and energy in circuits, Potential Dividers.	**Topic 5[4/5]: Waves and Particle Nature of Light -** Wave types and behaviour, including superposition leading to the formation of standing waves, diffraction gratings and the discussion of Wave Particle Duality	**Topic 8[6]: Nuclear and Particle Physics -** Atomic structure, particle accelerators, antiparticles and quarks, detecting particles	**Topic 11[6]: Nuclear Radiation -** Radioactive decay, exponential law of decay, nuclear fission and fusion
	Skills	**Maths** plotting two variables from experimental data, calculating rate of change from a graph showing a linear relationship, identifying uncertainties in measurements, using simple techniques to determine uncertainty when data are combined, using angles in regular 2D and 3D structures with force diagrams and using sin, cos and tan in physical problems. **Practical** **CORE PRACTICALS 1, 4 and 5** safely and correctly use a range of practical equipment and materials, follow written instructions, make and record observations ,keep appropriate records of experimental activities, present information and data in a scientific way, use appropriate software and tools to process data, carry out research and report findings		**Maths** substituting numerical values into algebraic equations using appropriate units for physical quantities and applying the equation y = mx + c to experimental data, using calculators to handle sin x, identifying uncertainties in measurements and using simple techniques to determine uncertainty when data are combined. **Practical** **CORE PRACTICALS 2, 3, 6,7,8** skills from previous term AND apply investigative approaches and methods to practical work, use online and offline research skills including websites, textbooks and other printed scientific sources of information, correctly cite sources of information		**Maths** using appropriate units in calculations, applying the concepts underlying calculus (but without requiring the explicit use of derivatives or integrals) by solving equations involving rates of change, for example. $\Delta x / \Delta t = -\lambda x$ using a graphical method or spreadsheet modelling and understanding probability in the context of radioactive decay. **Practical** **CORE PRACTICAL 15** skills from previous terms AND apply investigative approaches and methods to practical work, use a wide range of experimental and practical instruments, equipment and techniques appropriate to the knowledge and understanding included in the specification	
	ASSESSMENT	1 ILT (in Year 12 booklet) and 1 mid - topic test at midpoint of topic 2	1 ILT (in Year 12 booklet) and 1 end of topic test per topic	1 ILT (in Year 12 booklet) and 1 end of topic test per topic	1 ILT (in Year 12 booklet) and 1 end of topic test per topic	1 ILT and 1 end of topic test per topic	**END OF YEAR 12 ASSESSMENT, based on topics 1-5**

Year 13 Physics classes are taught by 1 Physics specialist teacher. Core Practicals are delivered within the relevant topics to enhance knowledge, understanding and investigative skills and also provide evidence for the Practical Endorsement qualification. Mathematical skills are developed within topics also. Many topics in year 13 build on the foundation skills/knowledge developed in previous topics (linked topic code in red).

		Autumn		Spring		Summer	
Year 13		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Knowledge	**Topic 6[1/2]: Further Mechanics -** Momentum and 2D collisions, Force, Impulse and Energy, Circular Motion **Topic 12[2/6/7]: Gravitational Fields -** shape and behaviour of fields, comparatively, Newton's law of gravitation, satellite speed and type **Topic 7[2/3/8]: Electric and Magnetic Fields -** Electric Fields, capacitors, magnetic fields and forces, EMI	**Topic 10[2/6/8/12]: Space -** Determining astronomical distances, H-R diagrams and the life-cycles of stars, Doppler effect and the Fate of the Universe. **Topic 9[2/7/8]: Thermodynamics -** internal energy, ideal gases, kinetic theory, black body radiators.	**Topic 13[5/6]: Oscillations -** Simple Harmonic Motion, free and forced oscillations	Exam preparation	Exam preparation	
	Skills	**Maths** translating between degrees and radians and using trigonometric functions, sketching relationships which are modelled by $y = k/x$, and $y = k/x^2$, using logarithmic plots to test exponential and power law variations, interpreting logarithmic plots and sketching relationships that are modelled by $y = e^{-x}$ **Practical** **CORE PRACTICALS 9, 10 and 11** safely and correctly use a range of practical equipment and materials, follow written instructions, make and record observations ,keep appropriate records of experimental activities, present information and data in a scientific way, use appropriate software and tools to process data, carry out research and report findings		**Maths** substituting numerical values into algebraic equations using appropriate units for physical quantities **Practical** **CORE PRACTICALS 12,13, 14 and 16** skills from previous term AND apply investigative approaches and methods to practical work, use online and offline research skills including websites, textbooks and other printed scientific sources of information, correctly cite sources of information		Revision	

	ASSESSMENT	1 ILT and 1 end of topic test per topic	**NOVEMBER ASSESSMENT** **Topics 1-5, 6,7 and 12**	1 ILT and 1 end of topic test per topic	**MARCH ASSESSMENT** **All topics**		

Qualification aims and objectives

The aims and objectives of the Pearson Edexcel Level 3 Advanced GCE in Physics are to enable students to develop:

- essential knowledge and understanding of different areas of the subject and how they relate to each other
- a deep appreciation of the skills, knowledge and understanding of scientific methods
- competence and confidence in a variety of practical, mathematical and problem-solving skills
- their interest in and enthusiasm for the subject, including developing an interest in further study and careers associated with the subject
- an understanding of how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society.

https://qualifications.pearson.com/content/dam/pdf/A%20Level/Physics/2015/Specification%20and%20sample%20assessments/PearsonEdexcel-Alevel-Physics-Spec.pdf