CNCS

A Level Physics: Curriculum Overview

Rationale: Throughout the course students will build on their knowledge and understanding of Physics concepts covered at KS4 (e.g. forces, waves, electricity) and to develop their mathematical, practical & investigative and problem solving skills.

A learner in BTEC Level 3 Applied Science will know/ have studied:	**A learner in BTEC Level 3 Applied Science will be able to:**
Particles, Quantum Phenomena, Waves, Mechanics, Materials, Electricity, Fields, Thermal Physics, Nuclear Physics, Turning points in Physics. They will have carried out practical and investigative work to develop their skills in line with the Core Practical Assessment Criteria (CPAC), in order to achieve a Practical Endorsement to accompany their grade at the end of the course.	Apply a range of practical and investigative approaches, including working safely in a lab, using a range of practical and measuring instruments, collecting, processing and analysing data. They will be able to describe and explain Physics concepts in words and apply relevant equations and relationships to solve problems.

Year	Term	Outline	Assessment	Home Learning	Key Skills/ End Point
12	**1**	**PARTICLES** Knowledge: Consituents of the atom, stable & unstable nuclei, particles, anti-particles, photons, particle interactions, quarks & antiquarks, conservation laws **Mechanics** Scalars & vectors, moments, motion along a straight line, projectiles, Newton's laws, momentum, work, energy & power, **QUANTUM PHENOMENA** Knowledge: The Photoelectric Effect, collision of electrons with atoms, Energy levels & photon emission, Wave-particle duality	**Pit stops** Particles Pitstop 1 Particles Pitstop 2 Waves Pitstop 1 Waves Pitstop 2 Quantum Phenomena Pitstop 1 Quantum Phenomena Pitstop 2 **Required Practical 1&2** **End of term assessment** 2 x 45 minute papers Paper 1 – Particles & quantum Phenomena Paper 2 - Waves	Summary notes, practice tasks & questions, exam questions application and revision.	Using knowledge and understanding developed at KS4, students will build on key Physics concepts such as atomic structure & waves. They will also study concepts at the forefront of Physics such as particle physics and quantum physics
	2	**WAVES** Knowledge: Progressive waves, Longitudinal and transverse waves,	**Pit stops** Mechanics Pitstop 1	Summary notes, practice tasks & questions, exam	The second term will build upon the key knowledge from term one and extend the GCSE knowledge to a level

		Superposition, stationary waves, diffraction, interference, refraction. **<u>Materials</u>** Properties of solids, density, Hooke's law, tensile stress & strain, Young modulus **<u>Electricity</u>** Electricity basics. I-V characteristics, resistivity, circuits, potential divider, EMF & internal resistance.	Mechanics Pitstop 2 Mechanics Pitstop 3 Materials Pitstop 1 Electricity Pitstop 1 Electricity Pitstop 2 **<u>Required Practical</u>** **3,4,5,6** **<u>End of term assessment</u>** 2 x 45 minute papers Paper 1 – Mechanics Paper 2 – Materials & Electricity	questions application and revision.	3 standard. They will learn to solve complex mechanics problems using their mathematical skills.
	3	**<u>Further Mechanics</u>** Circular motion, Simple Harmonic Motion (SHM)	**<u>Pit stops</u>** Further Mechanics Pitstop 1 Further Mechanics Pitstop 2 **<u>Required Practical</u>** **7** **<u>End of term assessment</u>** 2 x 90 minute papers (to mirror an AS assessment)	Summary notes, practice tasks & questions, exam questions application and revision.	The final term on year 12 will provide opportunities to revise the material covered for the Summer assessments that will mirror an AS exam structure. Students will also complete introductory lessons on topics to be covered in Y13

13	**1**	**Fields** Gravitational Fields, Electric Fields, Magnetic fields, Capacitance: Types of field, gravitational fields, Newton's law, G, g field strength, g potential, orbits of planets and satellites, electric fields, coulomb's law, E field strength, E potential, Capacitance, structure of a capacitor, energy stored, charge & discharge. Magnetic flux density, moving charges in magnetic fields, magnetic flux & flux linkage, electromagnetic induction, alternating current, transformers. **Nuclear** Radioactivity, Rutherford scattering, radioactive decay, instability, nuclear radius, mass and energy, fission, nuclear power & safety.	**Pit stops** Gravitational fields Pitstop Electric Fields Pitstop Magnetic fields Pitstop Capacitance pitstop Nuclear Physics Pitstop **Required Practical** **10,11 , 12** **End of term assessment** 2 x 1	Summary notes, practice tasks & questions, exam questions application and revision.	Fields is a large and complex topic in Y13. A lot of time will be spent on developing students understanding from a conceptual and mathematical viewpoint.
	2	**Thermal Physics** Knowledge: Internal energy, specific heat capacity, specific latent heat, ideal gas equation. **Option – Turning Points in Physics** Knowledge: The discovery of the electron, wave-particle duality, special relativity	**Pit stops** Thermal Physics Pitstop 1 Thermal Physics Pitstop 2 Turning Points pitstop 1 Turning Points pitstop 2 **Required Practical** **8** **End of term assessment** 2 x 2 hour Mock exam	Summary notes, practice tasks & questions, exam questions application and revision.	Students will begin the Option topic which will give them an opportunity to revisit some concepts encountered in Y12.
	3	**Option – Turning Points in Physics** Knowledge: The discovery of the electron, wave-particle duality, special relativity	**Pit stops** Turning Points pitstop 3 **Required Practical** **Practical endorsement awarded** **End of term assessment** 3X Terminal exam	Summary notes, practice tasks & questions, exam questions application and revision.	Students will review work ready to take their 3 external exams.