

Christchurch Boys' High School

Year 13 Physics - Course Content

Introduction

Students in Year 13 will follow a syllabus which aims to:

- Promote a view of physics as a human activity, including its applications, technological developments and relevance to the lives of people.
- Develop students' knowledge and understanding of physical phenomena.
- Develop students' skills of investigation and enquiry.

Content

The course of study consists of five sections.

- **Practical Skills**

Develop scientific skills and attitudes in focussing and planning, information gathering, processing and interpreting and reporting by carrying out practical investigations to determine relationships, patterns and trends in physical systems.

- **Atomics Physics**

A study of photons, atoms and nuclei including nuclear fission and fusion.

- **Mechanics**

A study of translational, rotational and oscillatory motion including gymnastics, diving and bungee jumping.

- **Wave Motion**

This includes ideas relating to ocean waves, seismology, light waves, sounds and acoustics.

- **Electromagnetism**

A study of electrical circuits and their components (such as resistors, diodes and transistors), the links between electricity and magnetism (electric motors, particle accelerators) and alternating current ideas.

Skills, Knowledge and Attitudes

The candidates for NCEA Level 3 are expected to show:

- Understanding and knowledge, including recall of facts.
- Understanding of concepts and principles and their use in familiar and unfamiliar situations.
- Skills of problem solving and communication.
- The ability to link the physics learned with applications, technologies and the lives of people.

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Year 13 Physics - Assessment Programme

The Year 13 Physics course will be assessed using Level 3 Achievement Standards as follows:

Ref.	Title	Credits	Assess. Mode
3.1 90774	Carry out a practical physics investigation with guidance, that leads to a mathematical relationship <ul style="list-style-type: none">• Planning and data collection (aim, method and raw results collected for non-linear data).• Data processing, interpretation, and evaluation (processed results, determination of uncertainties, linear graph, conclusion and discussion).	5	Internal Exam Block Term 2
3.3 90520	Demonstrate understanding of wave systems. <ul style="list-style-type: none">• Interference (quantitative) of electromagnetic and sound waves.• Multi-slit interference and diffraction gratings.• Standing waves in strings and pipes.• Doppler effect for a stationary observer.	4	External
3.4 90521	Demonstrate understanding of mechanical systems. <ul style="list-style-type: none">• Centre of mass and momentum and impulse (in 1 and 2D).• Velocity, acceleration and forces on objects moving in a circle (2 or more forces).• Rotational motion with constant angular speed and acceleration.• Analysis of a particle undergoing SHM.	6	External
3.5 90522	Demonstrate understanding of atoms, photons and nuclei. <ul style="list-style-type: none">• Bohr model of the hydrogen atom.• Photons and energy and atomic line spectra.• Photoelectric effect and the wave/particle light model duality.• Conservation of mass-energy for nuclear reactions.	3	External
3.6 90523	Demonstrate understanding of electrical systems. <ul style="list-style-type: none">• Kirchoff's Laws applications.• Faraday's Law and Lenz's Law.• Inductors and capacitors in DC circuits.• Resistors, inductors and capacitors in AC circuits.	6	External

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