

Physics

General senior subject

General

Physics provides opportunities for students to engage with the classical and modern understandings of the universe. In Unit 1, students learn about the fundamental concepts of thermodynamics, electricity and nuclear processes. In Unit 2, students learn about the concepts and theories that predict and describe the linear motion of objects. Further, they will explore how scientists explain some phenomena using an understanding of waves. In Unit 3, students engage with the concept of gravitational and electromagnetic fields, and the relevant forces associated with them. Finally, in Unit 4, students study modern physics theories and models that, despite being counterintuitive, are fundamental to our understanding of many common observable phenomena.

Students will learn valuable skills required for the scientific investigation of questions. In addition, they will become citizens who are better informed about the world around them, and who have the critical skills to evaluate and make evidence-based decisions about current scientific issues.

Physics aims to develop students':

- appreciation of the wonder of physics and the significant contribution physics has made to contemporary society
- understanding that diverse natural phenomena may be explained, analysed and predicted using concepts, models and theories that provide a reliable basis for action
- understanding of the ways in which matter and energy interact in physical systems across a range of scales
- understanding of the ways in which models and theories are refined, and new models and theories are developed in

physics; and how physics knowledge is used in a wide range of contexts and informs personal, local and global issues

- investigative skills, including the design and conduct of investigations to explore phenomena and solve problems, the collection and analysis of qualitative and quantitative data, and the interpretation of evidence
- ability to use accurate and precise measurement, valid and reliable evidence, and scepticism and intellectual rigour to evaluate claims
- ability to communicate physics understanding, findings, arguments and conclusions using appropriate representations, modes and genres.

Pathways

A course of study in Physics can establish a basis for further education and employment in the fields of science, engineering, medicine and technology.

Objectives

By the conclusion of the course of study, students will:

- describe ideas and findings
- apply understanding
- analyse data
- interpret evidence
- evaluate conclusions, claims and processes
- investigate phenomena.

Structure

Unit 1	Unit 2	Unit 3	Unit 4
Thermal, nuclear and electrical physics • Heating processes • Ionising radiation and nuclear reactions • Electrical circuits	Linear motion and waves • Linear motion and force • Waves	Gravity and electromagnetism • Gravity and motion • Electromagnetism	Revolutions in modern physics • Special relativity • Quantum theory • The Standard Model

Assessment

Schools devise assessments in Units 1 and 2 to suit their local context.

In Units 3 and 4 students complete *four* summative assessments. The results from each of the assessments are added together to provide a subject score out of 100. Students will also receive an overall subject result (A–E).

Summative assessments

Unit 3		Unit 4	
Summative internal assessment 1 (IA1): • Data test	10%	Summative internal assessment 3 (IA3): • Research investigation	20%
Summative internal assessment 2 (IA2): • Student experiment	20%		
Summative external assessment (EA): 50% • Examination — combination response			