



Highfields State
Secondary College

Semester 2 Course Overview

Faculty: Science

Subject: Physics

Year level: 11

Course Outline

At the core of all scientific endeavour is the inquiry into the nature of the universe. Science uses a systematic way of thinking, involving creative and critical reasoning, in order to acquire better and more reliable knowledge. Scientists recognise that knowledge is not fixed, but is fallible and open to challenge. As such, scientific endeavour is never conducted in isolation, but builds on and challenges an existing body of knowledge in the pursuit of more reliable knowledge.

This collaborative process, whereby new knowledge is gained, is essential to the cooperative advancement of science, technology, health and society in the 21st century. Tertiary study in any field will be aided by the transferable skills developed in this senior Science subject. It is expected that an appreciation of, and respect for, evidence-based conclusions and the processes required to gather, scrutinise and use evidence will be carried forward into all aspects of life beyond the classroom.

The purpose of senior Science subjects in Queensland is to introduce candidates to a scientific discipline. Candidates will be required to learn and apply aspects of the knowledge and skill of the discipline (thinking, experimentation, problem-solving and research skills), understand how it works and how it may impact society.

Upon completion of the course, candidates will have an appreciation for a body of scientific knowledge and the process that is undertaken to acquire this knowledge. They will be able to distinguish between claims and evidence, opinion and fact, and conjecture and conclusions.

The syllabus objectives include:

- describe and explain scientific concepts, theories, models and systems and their limitations
- apply understanding of scientific concepts, theories, models and systems within their limitations
- analyse evidence
- interpret evidence
- investigate phenomena
- evaluate processes, claims and conclusions
- communicate understandings, findings, arguments and conclusions.

Term 3	Term 4
<p>Unit 2, Topic 2: Waves</p> <p>In Unit 2, Topic 2, students investigate common wave phenomena, using waves on springs, sound waves and consideration of seismic waves. They compare the behaviour of these waves with the behaviour of light, leading to an explanation of light phenomena, including constructive and destructive interference, and diffraction, in terms of a wave model.</p> <p>Contexts that could be investigated in this unit include technologies such as photo radar, music, hearing aids, echo locators, fibre optics, DVDs and lasers.</p> <p>Assessment (FA4) – Examination This assessment requires students to recall and apply knowledge from Unit’s 1 and 2, taught throughout terms 1-3.</p>	<p>Unit 3: Gravity and electromagnetism</p> <p>In Unit 3, students develop a deeper understanding of motion and its causes by using Newton’s laws of motion and the gravitational field model to analyse motion on inclined planes, and the motion of projectiles and satellites. Field theories have enabled physicists to explain a vast array of natural phenomena and have contributed to the development of technologies that have changed the world, including electrical power generation and distribution systems, artificial satellites and modern communication systems. Students develop their understanding of field theories of gravity and electromagnetism through investigations of motion and electromagnetic phenomena. Finally, they will investigate the production of electromagnetic waves.</p> <p>Throughout the unit, students develop skills in planning and conducting investigations, interpreting results and evaluating the validity of primary and secondary data, as well as the communication of these evaluations to others in a range of formats.</p> <p>Formative assessment – Monitoring task Students are required to recall and apply concepts covered in Unit 3, Topic 1 (gravity and motion).</p>