



VCE PHYSICS

INFORMATION GUIDE



120 CELEBRATING 120 YEARS
1904-2024

Kilbreda College

VCE PHYSICS

RATIONALE

VCE Physics enables students to use observations, experiments, measurements and mathematical analysis to develop qualitative and quantitative explanations for phenomena occurring from the subatomic scale to macroscopic scales. They explore the big ideas that changed the course of thinking in physics such as relativity and quantum physics. While much scientific understanding in physics has stood the test of time, many other areas continue to evolve, leading to the development of more complex ideas and technological advances and innovation. In undertaking this study, students develop their understanding of the roles of careful and systematic observation, experimentation and modelling in the development of theories and laws. They undertake practical activities and apply physics principles to explain and quantify phenomena.

UNIT 1

Area of Study 1

How are light and heat explained?

In this area of study, students study light using the wave model and thermal energy using a particle model forming an understanding of the fundamental physics ideas of reflection, refraction and dispersion. They use these to understand observations made of the world such as mirages and rainbows. They investigate energy transfers and explore how light and thermal energy relate to one another. They apply light ideas to explain how light is used through optical fibres in communication, and how physics is used to inform global warming and climate change.

Area of Study 2

How is energy from the nucleus utilised?

In this area of study, students build on their understanding of energy to explore energy that derives from the nuclei of atoms. They learn about the properties of the radiation from the nucleus and the effects of this radiation on human cells and tissues and apply this understanding to the use of radioisotopes in medical therapy.

Area of Study 3

How can electricity be used to transfer energy?

In this area of study, students develop conceptual models to analyse electrical phenomena and undertake practical investigations of circuit components. Concepts of electrical safety are developed through the study of safety mechanisms and the effect of current on humans. Students apply and critically assess mathematical models during experimental investigations of DC circuits. They explore electrical safety and the use of transducers to transfer energy in common devices.

UNIT 2

Area of Study 1

How is motion understood?

In this area of study, students describe and analyse graphically, numerically and algebraically the energy and motion of an object, using specific physics terminology and conventions. They consider the effects of balanced and unbalanced forces on motion and investigate the translational and rotational forces on static structures. Students apply mathematical models during experimental investigations of motion, and apply their understanding of motion and force through a case study.

Area of Study 2

How does physics inform contemporary issues and applications in society?

In this area of study, students develop a deeper understanding of an area of interest within diverse areas of physics. They select from eighteen options, explore the related physics and use this physics to form a stance, opinion or solution to a contemporary societal issue or application. In their explorations, a range of investigation methodologies may be used by students.

Area of Study 3

How do physicists investigate questions?

In this area of study, students adapt or design and then conduct a scientific investigation to generate appropriate primary qualitative and/or quantitative data, organise and interpret the data, and reach and evaluate a conclusion in response to the research question.



CAREER OPTIONS

- Aerospace Engineer
- Architect
- Astronomer
- Civil Engineer
- Defence Force
- Doctor
- Electrician
- Geologist
- Mechanical Engineer
- Medical Imaging
- Nuclear Medicine
- Technologist
- Optometrist
- Physicist
- Pilot
- Prosthetist
- Radiography
- Sound Technician
- Surveyor
- Surveyor
- Telecommunications

UNIT 3

Area of Study 1

How do physicists explain motion in two dimensions?

In this area of study students use Newton's laws of motion to analyse linear motion, circular motion and projectile motion. Newton's laws of motion give important insights into a range of motion both on Earth and beyond through the investigations of objects on land and in orbit. They explore the motion of objects under the influence of a gravitational field on the surface of Earth, close to Earth and above Earth. They explore the relationships between force, energy and mass.

Area of Study 2

How are fields used to move electrical energy?

In this area of study students use empirical evidence and models of electric, magnetic and electromagnetic effects to explain how electricity is produced and delivered to homes. They explore magnetic fields and the transformer as critical to the performance of electrical distribution systems.

Area of Study 3

How are fields used in electricity generation?

In this area of study students use empirical evidence and models of electric, magnetic and electromagnetic effects to explain how electricity is produced and delivered to homes. They explore the transformer as critical to the performance of electrical distribution systems in minimising power loss.

UNIT 4

Area of Study 1

How has understanding about the physical world changed?

In this area of study students learn how understanding of light, matter and motion have changed over time. They explore how major experiments led to the development of theories to describe these fundamental aspects of the physical world.

Area of Study 2

How is scientific inquiry used to investigate fields, motion or light?

Students undertake a student-designed scientific investigation in either Unit 3 or Unit 4, or across both Units 3 and 4. The investigation involves the generation of primary data relating to fields, motion or light. The investigation draws on knowledge and related key science skills developed across Units 3 and 4 and is undertaken by students in the laboratory and/or in the field.



To find out more information about VCE Physics
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This flyer is correct as of July 2024, however may be subject to change.

