

Physics

Subject guide 2007

This subject guide relates to courses developed from the Physics Senior Syllabus 2007.

What is Physics all about?

Physics is the study of the nature and properties of matter and energy and how they interact with each other. It is an investigative and experimental science that involves formulating and testing hypotheses through analysing phenomena in order to understand how the universe works. Physics values methods of precise measurement, reproducible experimentation and powerful mathematical relationships. Physics frequently represents theories and phenomena mathematically. The knowledge and understandings of Physics is constantly expanding, contributing to new information, ideas and theories to explain observations and experiences.

What will you learn?

In Physics, subject matter is derived from key concepts and key ideas. The key concepts are organised under the headings of Forces, Energy and Motion.

- **Forces**
 - The nature of a force.
 - Forces that act on objects influence their state of equilibrium.
 - Forces are able to influence the motion and shape of objects.
 - The forces that act on objects influence their internal energy.
- **Energy**
 - Energy may take different forms originating from forces between, or relative motion of, particles or objects.
 - Energy is conserved.
 - Energy transfer processes provide us with different ways of using and dealing with energy and radiation and these have different social consequences and applications.
- **Motion**
 - Motion can be described in different ways.
 - Motion can be analysed in different ways.
 - Motion can be described using various models and modern theories. You will progressively explore and develop your understandings of these over the course of study through six to twelve units of work.

How will you learn?

When you study Physics you will be involved in many interesting learning activities, including:

- examining national science initiatives

- using various forms of technology and equipment
- researching from primary and secondary sources, while applying the principles of research ethics interpreting data from wide-ranging sources, including media
- analysing current strategies or policies of the issue being investigated
- analysing strategies and evaluating effectiveness or improvements and proposing and/or implementing strategies for improvement
- formulating hypotheses and testing them
- participating in fieldwork
- conducting interviews
- predicting impact of recommendations of a science report/experiment
- making decisions and solving problems
- undertaking experiments and engaging in active research projects, independently and with others
- participating in forum discussions and debates
- sharing information mutually beneficial to the group
- advocating for change.

How will you be assessed?

Assessment in Physics gives you opportunities to demonstrate *Knowledge and conceptual understanding*, *Investigative processes* and *Evaluating and concluding*.

In Physics, assessment instruments include:

- extended experimental investigations — within this mandatory category, instruments are developed to investigate a hypothesis or to answer a practical research question
- supervised assessments — within this mandatory category, instruments such as written tests are used, and conducted under supervised conditions to ensure authentication of student work
- extended response tasks — within this category, instruments are developed in response to a Physics question, circumstance or issue and while they are essentially non-experimental they may draw on primary experimental data.

In Year 12, you will be expected to complete at least four and a maximum of six assessment instruments, of which one will be an extended experimental investigation and at least one supervised assessment.

How can parents/carers help?

Your parents/carers may help you by:

- discussing different views of current Physics issues with you
- encouraging and helping you find suitable websites, documentaries, journals and other resources
- encouraging you to take part in school-based activities, including field trips, and extracurricular activities

- offering their services as guest speakers if they are involved in this area of study or related industry
- encouraging safe and ethical behaviour
- contacting your school to establish communication with your teachers to help understand the work undertaken at senior level, and to become familiar with assessment requirements.

Where can Physics take you?

This subject contributes four credits towards the Queensland Certificate of Education (QCE). If you would like to learn more about this certificate, please visit the QCE page on the QCAA website www.qcaa.qld.edu.au/589.html.

Studying Physics will provide you with a suite of skills and understandings that are valuable to a wide range of further study pathways and careers. It will help you to become better informed about the world around you and provide the critical skills so you can evaluate and make evidence-based decisions about current scientific issues. It will provide a foundation in physics knowledge, understanding and skills and is suitable as a precursor to tertiary study in science, engineering, medicine and technology.

For further information about future tertiary pathways, consult the QTAC Guide to Tertiary Courses www.qtac.edu.au.

More information

If you would like more information, please email senior.syllabuses@qcaa.qld.edu.au. You can also visit the QCAA website www.qcaa.qld.edu.au and search for 'Physics'.