

PHYSICS

AIMS

- to develop an understanding of the natural laws of the physical universe.
- to examine how the applications of physics affect our daily lives
- to examine achievements in physics and the resulting changes these achievements have produced in our society
- to develop an ability to apply physics understandings, skills and mental processes to public issues
- to engage in creative and critical scientific thinking

CONTENT

The physics units have been set up for study in context. Each context lasts a term or semester. (Aspley State High School has been selected to trail the new physics syllabus which follows the education trends adopted in NSW and Victoria)

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| Semester 1 | Optical Instruments (Refraction Snells Law)
On the Road.(Measurement, Speed, Velocity Newtons Laws) |
| Semester 2 | Energy Efficiency in the Home (Electric Charge, Power)
Amusement Park Physics (Momentum, Conservation of Mechanical Energy) |
| Semester 3 | The Search for Understanding. (Gravity, Keplers, Black Holes)
Physics of Sport (Kinetic Energy, Hooke's Law) |
| Semester 4 | Medical Imaging – Radiation and Health (Radioactivity)
Practical Electronics – The Electronics of Play. (Transisters) |

SUGGESTED STANDARD IN PRIOR LEARNING.

This is a difficult subject. Students will need to have already displayed higher than average results in Strand A Mathematics and Junior Science, to be able to cope with the subject.

ASSESSMENT

Physics involves students as rational and creative thinkers, engaged in the acquisition of knowledge and the development of understanding of physical aspects of their world through processes of scientific investigation in real world contexts.

The general objectives of the syllabus are categorised as follows:

- attitudes and values
- knowledge and conceptual understanding
- scientific techniques.
- scientific investigation

There are 3 types of assessment items which are equally weighted towards the overall rating:

Extended experimental investigation (EEI)

An extended experimental investigation involves a task where the student works to answer an open-ended research question. It would be conducted over a lengthy period of time, perhaps a few weeks to a term or longer.

Extended Response Task (ERT)

The Extended Response Task may require students to interpret, analyse and evaluate some stimulus material, for example, a societal or environmental issue. The response may be presented in a variety of forms such as a written assignment, report or non-written presentation.

Written test (WT)

Written tests commonly include quantitative and qualitative tasks and are carried out under examination conditions.

Timing of assessment instruments:

Task 1	WT	Late Term 1
Task 2	WT	Late Term 2
Task 3	EEI	Late Term 3
Task 4	ERT	Late Term 4

PHYSICS RESTRICTIONS

Students may choose from the following:

- Physics only (+ 5 non-science subjects)
- Physics and Chemistry
- Physics and Chemistry and Biology
- Physics and Multi-strand Science
- Physics and Biology

ADDITIONAL INFORMATION

It is anticipated that students studying Physics will be required to attend one excursion per year. These excursions are designed to expose students to the application of Physics to the real world.

Aspley State High School
Physics Extended Trial Pilot
Scope & Sequence

Sem	Context	Weeks (Hours)	Key Concepts			Key Ideas	Assessment			
			F	E	M		Task	Description	Task Type	Conditions
1	Optical Instruments	8 (22)		E3	M3	<ul style="list-style-type: none"> What is Light?, Wave/Particle Duality, Refraction, Snell's Law, Dispersion, Lens Types, Focal Length, Lens equation, Anatomy of the eye, Colour vision, Abnormal conditions of the eye, reflection, images in plane and curved mirrors, Total internal reflection, critical angles. 	1	90 minute Written Test	WT	Individual In class under exam conditions. No teacher input
1	On the Road	12 (33)	F1 F2 F3 F4		M1 M2	<ul style="list-style-type: none"> Measurement, Scalar & Vector Quantities, Addition and Subtraction of Vectors, Speed & Velocity, Acceleration, Graphical analysis of motion, Constant linear acceleration, Equations and problems, Force, Newtons Three Laws, Mass, Weight, Friction, Terminal velocity, Inclined planes. 	2	90 minute Written Test	WT	Individual In class under exam conditions. No teacher input
2	Energy Efficiency in the Home	14 (38)	F1 F2	E2 E3 E4	M4	<ul style="list-style-type: none"> Electric charge, Coulombs Law, Charging by induction, Electric Fields, Ohm's Law, Networks, Power Losses, Electrocutation and Electric Shock, Fibrillation, Magnetism, Magnetic Fields about wires, Heat, Temperature, Specific heat, Latent Heat, Expansion, Thermal conductivity, Convection, Conduction, Radiation. 	3	Investigate the efficiency of a household product/	EEI	8 weeks class time. Groups of Two or three. Minimal teacher input. Declaration of ownership by student.
2	Amusement Park Physics	6 (17)	F1 F2 F3 F4	E1 E3 E4	M1 M2	<ul style="list-style-type: none"> Momentum, Impulse, Conservation of Momentum, Work & Energy, Conservation of Mechanical Energy, Collisions in 1-D 	4	Field study booklet	ERT	1 day field trip + 1 week to complete booklet & report. Groups of two or three. Declaration of ownership by student.