

Appendix

References to Technology in Board of Studies NSW Physics and Biology Syllabuses

Section	Physics[a]	Biology[b]
Course Structure	<p>Practical experiences should emphasize hands-on activities, including (p. 9):</p> <ul style="list-style-type: none"> • undertaking laboratory experiments, including the use of <i>appropriate computer-based technologies</i> • research, using a wide range of sources, including print materials, the <i>Internet</i> and <i>digital technologies</i> • using <i>computer simulations</i> for modelling or manipulating data • using and reorganizing secondary data • extracting and reorganizing information in the form of flow charts, tables, graphs, diagrams, prose and keys • using <i>animation</i>, video and film resources to capture/obtain information not available in other forms 	<p>Practical experiences should emphasize hands-on activities, including (p. 9):</p> <ul style="list-style-type: none"> • undertaking laboratory experiments, including the use of <i>appropriate computer-based technologies</i> • research, using a wide range of sources, including print materials, the <i>Internet</i> and <i>digital technologies</i> • using <i>computer simulations</i> for modelling or manipulating data • using and reorganizing secondary data • extracting and reorganizing information in the form of flow charts, tables, graphs, diagrams, prose and keys • using <i>animation</i>, video and film resources to capture/obtain information not available in other forms
Skills - conducting investigations	<p>increasing students' skills in performing first-hand investigations, gathering first-hand data and accessing and collecting information relevant to physics from secondary sources <i>using a variety of technologies</i> (p. 13)</p>	<p>increasing students' skills in performing first-hand investigations, gathering first-hand data and accessing and collecting information relevant to biology from secondary sources <i>using a variety of technologies</i> (p. 14)</p>
Key Competencies	<p>During investigations, students use appropriate information technologies and so develop the key competency of <i>using technology</i> (p. 17)</p>	<p>During investigations, students use appropriate information technologies and so develop the key competency of <i>using technology</i> (p. 18)</p>
Domain: Skills	<p>Preliminary [c] (pp. 18-19)/HSC [d] (pp. 38-39) students:</p> <p>11.1 identify data sources to:</p> <p>e) recommend the use of an <i>appropriate technology or strategy for data collection</i> or gathering information that will assist efficient future analysis</p> <p>11.3 choose equipment or resources by:</p> <p>c) <i>identifying technology</i> that could be used during investigating and determining its suitability and effectiveness for its potential role in the procedure or investigations</p> <p>12.2 gather first-hand information by:</p> <p>a) using appropriate data collection techniques, <i>employing</i></p>	<p>Preliminary [c] (pp. 19-20)/HSC [d] (pp. 36-37) students:</p> <p>11.1 identify data sources to:</p> <p>e) recommend the use of an <i>appropriate technology or strategy for data collection</i> or gathering information that will assist efficient future analysis</p> <p>11.3 choose equipment or resources by:</p> <p>c) <i>identifying technology</i> that could be used during investigating and determining its suitability and effectiveness for its potential role in the procedure or investigations</p> <p>12.2 gather first-hand information by:</p> <p>a) using appropriate data collection techniques, <i>employing</i></p>

	<p><i>appropriate technologies, including data loggers and sensors</i></p> <p>12.3 gather information from secondary sources by:</p> <p>a) accessing information from a range of resources, including popular scientific journals, <i>digital technologies and the Internet</i></p> <p>12.4 process information to:</p> <p>c) best illustrate trends and patterns by selecting and using appropriate methods, including <i>computer-assisted analysis</i></p>	<p><i>appropriate technologies, including data loggers and sensors</i></p> <p>12.3 gather information from secondary sources by:</p> <p>a) accessing information from a range of resources, including popular scientific journals, <i>digital technologies and the Internet</i></p> <p>12.4 process information to:</p> <p>c) best illustrate trends and patterns by selecting and using appropriate methods, including <i>computer-assisted analysis</i></p>
<p>Preliminary Domain: knowledge and understanding</p>	<p>The wave model can be used to explain how current technologies transfer information</p> <ul style="list-style-type: none"> • Students: perform a firsthand investigation to observe and gather information about the transmission of waves in: <ul style="list-style-type: none"> ○ slinky springs ○ water surface ○ ropes ○ <i>or use appropriate computer simulations</i> (p. 22) • Students: perform a first-hand investigation to gather information about the frequency and amplitude of waves using an oscilloscope <i>or electronic data-logging equipment</i> (p.22) <p>Features of a wave model can be used to account for the properties of sound</p> <ul style="list-style-type: none"> • Students: perform a first-hand investigation and gather information to analyze sound waves from a variety of sources using the Cathode Ray Oscilloscope (CRO) <i>or an alternate computer technology</i> (p. 23) • Students: perform a first-hand investigation, gather, process and present information using a CRO <i>or computer</i> to demonstrate the principle of superposition for two waves travelling in the same medium (p.23) <p>Series and parallel circuits serve different purposes in households</p> <ul style="list-style-type: none"> • Students: plan, choose equipment or resources for and perform first-hand investigations to gather data and use available evidence to compare measurements of current and voltage in series and parallel circuits in <i>computer simulations</i> or hands-on equipment (p. 28) 	<p>none</p>
<p>HSC Domain: knowledge and understanding</p>	<p>The Earth has a gravitational field that exerts a force on objects both on it and around it</p> <ul style="list-style-type: none"> • Students: perform an investigation and gather information to determine a value for acceleration due to gravity using 	<p>none</p>

pendulum motion *or computer-assisted technology* and identify reason for possible variations from the value 9.8 ms^{-2} (p. 41)

Many factors have to be taken into account to achieve a successful rocket launch, maintain a stable orbit and return to Earth

- Students: perform a first-hand investigation, gather information and analyze data to calculate initial and final velocity, maximum height reached, range and time of flight of a projectile for a range of situations by *using simulations, data loggers and computer analysis* (p. 42)

The study of binary and variable stars reveals vital information about stars

- Students: perform an investigation to model the light curves of eclipsing binaries *using computer simulation* (p. 64)
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[a] Physics syllabus (Board of Studies NSW, 2009c)

[b] Biology syllabus (Board of Studies NSW, 2009a)

[c] Preliminary course studied in grade 11

[d] HSC course studied in grade 12