

## A Guide to the New Years 7–10 Syllabus

The new *Science Years 7–10 Syllabus* will replace the current syllabus and will be implemented in 2005 with Year 7 and Year 9 students.

The new syllabus is informed by contemporary research about how people learn and about how learning outcomes can be enhanced by teaching practice.

The syllabus promotes *assessment for learning* as an essential component of good teaching. It follows the broad directions established in the NSW Board of Studies *K–10 Curriculum Framework* and is part of a continuum of learning from Kindergarten to Year 12 that supports sustained, sequential, high quality learning.

### What is similar?

Much of the content is similar to the current syllabus content. Students will continue to:

- develop their science knowledge, understanding and skills through a range of contextualised learning experiences
- explore issues related to the history of science, nature and practice of science, applications and uses of science, implications for society and the environment, and current issues, research and development through the Prescribed Focus Areas
- develop scientific knowledge and understanding of the non-living world and living world using models, theories, laws, structures, systems and interactions
- develop their expertise in working scientifically through the skills of planning and conducting scientific investigations, communicating information and understanding, developing scientific thinking and problem-solving techniques, and working individually and in teams
- undertake practical experiences for a minimum of 50% of allocated course time

- undertake at least one substantial student research project in each of Stages 4 and 5.

Current programs can be modified to meet the requirements of the new syllabus and many existing units of work will form the bases of effective programs. The majority of existing resources will continue to be relevant.

The recent experience teachers have gained in implementing the Stage 6 Science syllabuses (1999 amended 2002) will assist in the implementation of the new *Science Years 7–10 Syllabus*.

### What is different?

The new syllabus builds on the current syllabus in directions identified through research into the teaching of Science in other systems nationally and internationally, and through consultation at forums, meetings and during wide circulation of the draft syllabus.

- The rationale of the syllabus has been revised.
- Some outcomes have been revised to strengthen the connections to the content statements.
- The overview of the skills content has been revised to clarify the relationship between the skill areas and working scientifically.
- The contexts overview has been amended to clearly identify the intent of scientific literacy in the syllabus.
- Aboriginal and Indigenous cross-curriculum content has been incorporated in the Prescribed Focus Area content.
- The structure of the syllabus has been simplified through a reduction in the number of organisational layers in the knowledge and understanding content.
- Some of the knowledge and understanding essential (core) content has been identified as additional (optional) content.

### The features of the content pages

Content is expressed as *Students learn about* and *Students learn to* in a consistent format.

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<b>Outcome 4.3:</b> A student identifies areas of everyday life that have been affected by scientific developments.	
<b>Outcome 5.3:</b> A student evaluates the impact of applications of science on society and the environment.	
<b>Essential Content</b>	
<b>Students learn about:</b>	<b>Students learn to:</b>
4/5.3 the applications and uses of science	<ul style="list-style-type: none"> <li>a) identify and describe examples of scientific concepts and principles that have been used in technological developments (including Australian examples)</li> <li>b) discuss, using examples, the positive and negative impacts of applications of recent developments in science</li> <li>c) identify and describe examples where technological advances have impacted on science</li> <li>d) give reasons why society should support scientific research.</li> </ul>

Teachers will select the appropriate Essential Content to achieve the relevant Stage 4 or 5 Prescribed Focus Area outcome.

Describes knowledge and understanding students should be able to demonstrate by the end of Stage 5.

#### Stage 5

<b>Outcome 5.6</b> A student applies models, theories and laws to situations involving energy, force and motion.	
<b>Essential Content</b>	
<b>Students learn about:</b>	<b>Students learn to:</b>
5.6.1 the wave model	<ul style="list-style-type: none"> <li>a) identify waves as carriers of energy</li> <li>b) qualitatively describe features of waves including frequency, wavelength and speed</li> <li>c) give examples of different types of radiation that make up the electromagnetic spectrum and identify some of their uses.</li> </ul>
5.6.2 Newton's Laws – motion	<ul style="list-style-type: none"> <li>a) describe qualitatively the relationship between force, mass and acceleration</li> <li>b) explain qualitatively the relationship between distance, speed and time</li> <li>c) relate qualitatively acceleration to a change in speed and/or direction as a result of a net force</li> <li>d) analyse qualitatively common situations involving motion in terms of Newton's Laws.</li> </ul>
5.6.3 electrical energy	<ul style="list-style-type: none"> <li>a) design, construct and draw circuits containing a number of components</li> <li>b) describe voltage, resistance and current using analogies</li> <li>c) describe qualitatively the relationship between voltage, resistance and current</li> <li>d) compare the characteristics and applications of series and parallel circuits.</li> </ul>
5.6.4 energy	<ul style="list-style-type: none"> <li>a) distinguish between the absorption, reflection and refraction of light and identify everyday situations where each occurs.</li> </ul>
5.6.5 nuclear energy	<ul style="list-style-type: none"> <li>a) identify that energy and particles may be released from the nuclei of atoms.</li> </ul>
5.6.6 gravitational force	<ul style="list-style-type: none"> <li>a) distinguish between the terms 'mass' and 'weight'.</li> </ul>

Additional Content may be included in Stage 4 or 5 programs for students who have demonstrated the outcomes in less than the indicative time.

**Additional Content is not prerequisite knowledge for following stages but may be used to broaden and deepen students' knowledge, understanding and skills in Stage 4 and/or Stage 5.**

<b>Students learn about:</b>	<b>Students learn to:</b>
Wave model	<ul style="list-style-type: none"> <li>• discuss similarities and differences between transverse and longitudinal wave models</li> <li>• relate the speed of light and the speed of sound to frequency and wavelength</li> <li>• compare different types of radiation making up the electromagnetic spectrum in terms of frequency, wavelength and energy</li> <li>• design and describe ways of enabling or impeding energy transfer by waves</li> <li>• describe quantitatively features of waves including frequency, wavelength and speed using <math>v = f\lambda</math>.</li> </ul>

- Some content statements have been amended to clarify the wording.
- The values and attitudes content statements have been removed.
- The glossary has been revised to remove some general terms and include key syllabus scientific terms.
- Outcomes and stage statements from Stage 1 to Stage 6 describe the continuum of learning in Science. This enables teachers to map students' learning development, and to plan and program work according to students' needs and abilities.
- An overview statement is provided that shows how each cross-curriculum area is embedded in the essential content.
- Content relating to the use and understanding of information and communication technologies (ICT) is incorporated in the syllabus content.
- Life Skills outcomes and content have been provided for those students with special education needs, particularly those students with an intellectual disability, for whom it has been determined that the outcomes and content found in sections 6 and 7 of the syllabus are not appropriate.
- Built into the syllabus is the concept that *assessment for learning* is integral to teaching and learning in a standards-referenced framework. *Assessment for learning* involves teachers planning how and when they will gather evidence of learning at the same time as they plan the work that students will do. It recognises the importance of assessment to student motivation and self-esteem, and promotes the active involvement of students in their own learning.

### How can the syllabus be used to program?

The syllabus outcomes provide the focus for teaching and learning in Science. This syllabus encourages a model of programming that begins with outcomes, and is precise about what is being taught and what is being learnt. Developing integrated programs from the new *Science Years 7–10 Syllabus* involves:

- identifying the outcomes to be addressed (see syllabus pp 12–15)
- identifying the required evidence of learning
- planning explicit teaching and learning experiences to address the outcomes (see syllabus pp 28–44) to allow students to demonstrate evidence of learning
- identifying strategies to teach the content
- incorporating *assessment for learning* by using the assessment advice in the syllabus and in the support material that will be provided by the Board of Studies.

The advice about additional content on pages 30–39 of the syllabus will assist teachers to develop programs for students who are demonstrating Stage 5 outcomes prior to the completion of Year 10.

The inclusion of outcomes and stage statements that describe a continuum of learning from Stage 1 to Stage 5 will assist teachers to program for students in Years 7–10 who have not yet demonstrated Stage 3 outcomes.

### How does the syllabus cater for all students?

A key principle of the *K–10 Curriculum Framework*, which guides K–10 syllabus development, is that the curriculum must be inclusive of all students in New South Wales.

The rationale, aim, objectives, outcomes and content of the syllabus have been designed to accommodate teaching approaches that support the learning needs of all students.

Students with special education needs will participate fully in learning experiences and assessment activities. These students may require additional support in terms of modified tasks and varied learning approaches. There may also be occasions when different strategies need to be adopted to broaden and deepen the learning experiences of gifted and talented students.

Life Skills outcomes and content, using the rationale, aim and objectives of this syllabus, have been included in section 8. They will provide the basis for a program of study for the small percentage of students with special education needs for whom the outcomes and content in sections 6 and 7 of the *Science Years 7–10 Syllabus* are not appropriate.

### What support is the Board providing to assist with initial implementation of the syllabus?

Following the release of the syllabus, support materials will be distributed to assist teachers in understanding the syllabus and its associated assessment requirements.

The first School Certificate credential based on the new syllabuses will be awarded in 2006. Specific advice about requirements for the School Certificate and the School Certificate Test will be provided well in advance of 2006.

<b>distributed with the syllabus</b>	<p><b>Phase 1</b></p> <ul style="list-style-type: none"> <li>■ this guide to the new <i>Science Years 7–10 Syllabus</i></li> <li>■ draft Descriptions of Levels of Achievement</li> </ul>
<b>3 months after distribution of the syllabus</b>	<p><b>Phase 2</b></p> <ul style="list-style-type: none"> <li>■ advice on programming</li> <li>■ sample units of work</li> <li>■ sample assessment activities</li> </ul>
<b>6 months after distribution of the syllabus</b>	<p><b>Phase 3 (incorporates Phases 1 and 2)</b></p> <ul style="list-style-type: none"> <li>■ annotated samples of student work</li> </ul>
<b>12 months after implementation of the syllabus</b>	<p><b>Phase 4</b></p> <ul style="list-style-type: none"> <li>■ final Descriptions of Levels of Achievement</li> </ul>

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The Department of Education and Training, the Catholic Education Commission, other school systems, the Association of Independent Schools and professional associations will assist and support the ongoing implementation of the syllabus.

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