The Australian curriculum is being implemented in New South Wales through new syllabuses developed by the Board of Studies. The new Science K–10 Syllabus will replace the current Science and Technology K–6 Syllabus and Science Years 7–10 Syllabus.

The new Science syllabus includes agreed Australian curriculum content and content that clarifies learning for Science from Kindergarten to Year 10. The stage statements for Early Stage 1 to Stage 5 reflect the intent of the Australian curriculum achievement standards.

The syllabus identifies the skills, knowledge, understanding, values and attitudes students are expected to develop at each stage, from Kindergarten to Year 10. Teachers will continue to have the flexibility to make decisions about the sequence of learning, the emphasis to be given to particular areas of content, and any adjustments required based on the needs, interests and abilities of their students.

The Years 7–10 section of the syllabus is designed to be taught within the existing NSW indicative time requirements.

Assessment for learning continues to be an essential component of the Science K–10 Syllabus.

Learning across the curriculum areas include cross-curriculum priorities, general capabilities and other important learning for all students. These 13 areas are incorporated in the content of each syllabus and identified by icons. Teachers may identify additional opportunities for students to learn about these areas.

The structure and many of the features of the current Science syllabus have been retained, including:

- objectives and outcomes
- content organised in Stages from Early Stage 1 to Stage 5.

**WHAT IS SIMILAR?**

Students will continue to:

- develop science skills, knowledge and understanding through learning experiences set in contexts that are relevant to students’ learning needs and interests
- explore scientific concepts through integration of content across the skills, knowledge and understanding strands
- develop skills in and understanding of the processes of Working Scientifically
- undertake practical experiences for a minimum of 50% of the allocated course time
- undertake at least one substantial student research project in each of Stage 4 and Stage 5
- develop knowledge and understanding about:
  - the nature, development, use and influence of science
  - scientific concepts, ideas and principles related to the Physical World, Earth and Space, the Living World and the Chemical World.

**WHAT IS DIFFERENT?**

- The structure of the syllabus has been simplified. The previous syllabus elements ‘Prescribed Focus Areas’ (PFAs) and ‘Domain’ have been replaced by the strands ‘Skills’ and ‘Knowledge and Understanding’.
- The skills content is specific for each stage.
- The emphasis on using science inquiry to develop science knowledge and understanding
has been strengthened by increased emphasis on the process of questioning and predicting.

- Students select and use technologies in applying the processes of Working Scientifically. They have increased opportunities to learn about emerging technologies.

- The knowledge and understanding strand in each stage integrates:
  - content that describes the nature, development, uses and influences of science
  - relevant science concepts, ideas and principles.

- Related Life Skills outcomes are included with the Stage 4 and Stage 5 content.

**HOW DOES THE SYLLABUS CATER FOR ALL STUDENTS?**

The *Science K–10 Syllabus* is inclusive of the learning needs of all students. Particular advice about supporting students with special education needs, gifted and talented students, and students learning English as an additional language or dialect is included in the syllabus.

Students with special education needs can access the *Science K–10 Syllabus* outcomes and content in a range of ways, including:

- under regular course arrangements
- with adjustments to teaching, learning and/or assessment experiences.

For some students with special education needs, particularly those with an intellectual disability, Life Skills outcomes and content can provide a relevant and meaningful program.

**WHAT IS THE PLAN FOR IMPLEMENTATION?**

<table>
<thead>
<tr>
<th>Year</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Familiarisation and planning</td>
</tr>
<tr>
<td>2014</td>
<td>Start teaching Years 7 and 9</td>
</tr>
<tr>
<td>2015</td>
<td>Start teaching Years 8 and 10</td>
</tr>
</tbody>
</table>

**WHAT SUPPORT IS THE BOARD PROVIDING?**

Many existing resources will continue to be useful and relevant. Current units of work can be modified to meet the requirements of the new syllabus, and some existing units will form the bases of effective programs.

For the first time, the Science syllabus will be available in an interactive online format. The interactive online format provides different ways to customise views of the syllabus. The online Science syllabus can be viewed by stage, outcomes and content, and provides links to support materials and other online resources.

Support materials will be distributed to assist teachers in understanding the syllabus and its associated assessment requirements.

**Initial materials**

Initial materials released with the syllabus include:

- this guide
- Schools’ guides
- Parents’ guide
- Advice on assessment.

**Additional materials**

Additional materials available later in 2012 and 2013 include:

- Advice on programming
- Sample units of work
- Further advice on assessment
- Program builder.

The Department of Education and Communities, the Catholic Education Commission, the Association of Independent Schools, and other school systems and professional associations will continue to assist and support the ongoing implementation of the syllabus.
GUIDE TO THE NEW NSW SYLLABUS

Features of the Science Years 7–10 skills content pages

SKILLS – WORKING SCIENTIFICALLY

PROBLEM SOLVING

OUTCOME

A student:

› applies scientific understanding and critical thinking skills to suggest possible solutions to identified problems. SC5-8WS

Related Life Skills outcome: SCLS-8WS

CONTENT

WS8 Students solve problems by:

a. describing strategies to develop a range of possible solutions to an identified problem
b. assessing strategies that have been identified as possible solutions to an identified problem
c. applying the processes of Working Scientifically in developing creative solutions to problems

d. using cause-and-effect relationships to explain ideas

e. using models to explain phenomena and make predictions
f. applying critical thinking in considering suggested proposals, solutions and conclusions, including a consideration of risk
g. evaluating different approaches used to solve problems. (ACSIS172, ACSIS206)

Content is organised in stages.

Outcomes are coded and linked to content.

Learning across the curriculum content is incorporated and identified by icons.

Australian curriculum content descriptions are identified by codes.

Skills content is organised by the processes of Working Scientifically.

Life Skills outcomes related to Stage 4 and Stage 5 outcomes are included.

Skills content is coded by the syllabus strand and describes what students should know and be able to do in applying the process.
Features of the Science Years 7–10 knowledge and understanding content pages

**CHEMICAL WORLD**

OUTCOMES

A student:

› describes the observed properties and behaviour of matter, using scientific models and theories about the motion and arrangement of particles SC4-16CW

› explains how scientific understanding of, and discoveries about the properties of elements, compounds and mixtures relate to their uses in everyday life. SC4-17CW

Related Life Skills outcomes: SCLS-22CW, SCLS-23CW

CONTENT

**CW2** Scientific knowledge and developments in technology have changed our understanding of the structure and properties of matter.

Students:

a. describe the properties and uses of some common elements, including metals and non-metals

b. identify how our understanding of the structure and properties of elements has changed as a result of some technological devices

c. identify some examples of common compounds

d. explain why internationally recognised symbols are used for common elements

e. describe at a particle level the difference between elements, compounds and mixtures, including the type and arrangement of particles (ACSSU152)

f. investigate how people in different cultures in the past have applied their knowledge of the properties of elements and compounds to their use in everyday life, eg utensils, weapons and tools.

**CW3** Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques. (ACSSU113)

Students:

a. describe the importance of water as a solvent in daily life, industries and the environment

b. describe aqueous mixtures in terms of solute, solvent and solution

c. relate a range of techniques used to separate the components of some common mixtures to the physical principles involved in each process, including filtration, decantation, evaporation, crystallisation, chromatography and distillation

d. investigate the application of a physical separation technique used in everyday situations or industrial processes, eg water filtering, sorting waste materials, extracting pigments or oils from plants, separating blood products or cleaning up oil spills

e. research how people in different occupations use understanding and skills from across the disciplines of Science in carrying out separation techniques.
Features of the Science Years 7–10 Life Skills skills content pages

Science Life Skills outcomes and content:
- are developed from the Science Years 7–10 objectives
- are selected based on students’ needs, interests and abilities.

Students are not required to complete all content to demonstrate achievement of an outcome.

**SKILLS – WORKING SCIENTIFICALLY**

**CONDUCTING INVESTIGATIONS**

**OUTCOME**

A student:
- participates in an investigation by following a sequence. SCLS-6WS

**Related Stage 4/5 outcomes:** SC4-6WS, SC5-6WS

**CONTENT**

Students conduct investigations by:
- using a range of techniques including practical experiences, surveys, fieldwork and research to gather data and information, using digital technologies as appropriate
- selecting and using appropriate equipment, measuring tools and methods to make accurate observations and measurements
- working individually and/or collaboratively to participate in an investigation
- making adjustments when necessary to a planned method for an investigation
- following safety rules when using equipment and tools in an investigation
- recording observations and measurements, using appropriate units and abbreviations.

Skills content is optional and organised by the processes of Working Scientifically.

Stage 4 and/or Stage 5 outcomes related to Life Skills outcomes are included.

Skills content is identified for the processes of Working Scientifically.

Content describes the scope and depth of learning.

Outcomes are coded and linked to content.

Learning across the curriculum content is incorporated and identified by icons.
Features of the Science Years 7–10 Life Skills knowledge and understanding content pages

Science Life Skills outcomes and content:

- are developed from the Science Years 7–10 objectives
- are selected based on students’ needs, interests and abilities.

Students are not required to complete all content to demonstrate achievement of an outcome.

Chemical World: Properties of Substances

Outcomes

A student:

- recognises the properties of common substances SCLS-22CW
- explores how common chemicals affect everyday life. SCLS-23CW

Related Stage 4/5 outcomes: SC4-16CW, SC5-16CW, SC4-17CW

Content

Mixtures can be separated using a range of techniques.

Students:

- recognise common mixtures that are naturally occurring and those that can be made, eg sea water, muddy water, cordial, tea containing milk and sugar or rice cooking in water
- recognise some substances that can be dissolved, eg sugar, liquid dishwashing detergent, oil in petrol for motor fuel or carbon dioxide gas in water for soft drinks
- observe the effects of dissolving a substance into another substance, eg sugar in water
- participate in an investigation to identify substances that can be dissolved and substances that cannot be dissolved
- identify different ways of separating mixtures, eg draining rice with a sieve, filtering coffee or evaporating water from salt water
- explore reasons for separating mixtures, eg water purification
- separate the components of some common mixtures through techniques including filtration, decantation, evaporation, crystallisation (dissolve sugar in water and leave in the sun to evaporate into sugar crystals) and chromatography (place coloured lollies in water and observe the food colouring separate using filter paper).