

New Stage 6 Syllabus CHEMISTRY



The new Chemistry syllabus has been developed using the established NSW Education Standards Authority (NESA) syllabus development process. The syllabus includes Australian curriculum content and reflects the new directions of the *Stronger HSC Standards* reforms.

The Stronger HSC Standards reforms include:

- supporting the achievement of high minimum standards for all students
- ensuring the flexibility and versatility of the Higher School Certificate (HSC) to cater for the full range of students
- encouraging every student to achieve at their highest possible level
- a focus on the acquisition of deep knowledge, understanding and skills for students.

NSW Stage 6 syllabuses are inclusive of the learning needs of all students. The syllabuses accommodate teaching approaches that support student diversity, including students with special education needs, gifted and talented students and students learning English as an additional language or dialect (EAL/D).

Many of the features of the current Stage 6 syllabuses have been retained, including:

- rationale
- aim
- objectives
- outcomes
- content for Year 11 and Year 12 courses.

New features of Stage 6 syllabuses include:

- Australian curriculum content identified by codes
- Learning across the curriculum content, including cross-curriculum priorities and general capabilities
- publication in an interactive online format
- an interactive glossary.

What is similar?

Students will continue to be provided with opportunities to:

- build on the knowledge, understanding and skills of the Chemical World in Stage 5 Science
- apply Working Scientifically skills in an integrated way
- · design and conduct practical investigations
- participate in fieldwork in Year 11 and Year 12.

What is different?

- Contexts have been removed to provide flexibility for teaching content.
- · Inquiry questions provide a focus for teaching and learning.
- There are increased opportunities for analysis using mathematical principles.
- The introduction of depth studies in Year 11 and in Year 12 provides opportunities to investigate areas of interest in more depth.
- New content includes:
 - electronic configuration and spdf notation
 - The Bohr and Schrodinger models
 - The Ideal Gas Law
 - Enthalpy and Hess's Law
 - Entropy and Gibbs Free Energy
 - Aboriginal and Torres Strait Islander Peoples' applications of chemical practices
 - calculating the Equilibrium Constant
 - analysis of organic compounds.

Why is assessment changing?

The *Stronger HSC Standards* reforms provide new directions for assessment practices in all Stage 6 courses to:

- · rebalance the emphasis on assessment to allow more time for teaching and learning
- · maintain rigorous standards
- provide opportunities to assess students' depth of knowledge and their conceptual, analytical and problem-solving skills.

School-based assessment requirements for Chemistry have changed to reflect new outcomes, course structure and content.

How are the school-based assessment requirements for Chemistry changing?

NESA continues to promote a standards-referenced approach to assessing and reporting student achievement. The approaches of assessment for, assessment as and assessment of learning are important to guide future teaching and learning opportunities and to provide students with ongoing feedback.

Changes to school-based assessment requirements for each course include:

- mandated components and weightings for Year 11 and Year 12
- capping the number of school-based assessment tasks to three in Year 11 and four in Year 12
- specified minimum and maximum weightings for formal tasks
- a variety of tasks to assess student knowledge, understanding and skills.

What is the plan for implementation?

2017	2018		2019
	Term 1	Term 4	
Familiarisation and planning	Start teaching new Year 11 courses for English, Mathematics, Science and History Start implementing new Year 11 school- based assessment requirements for all Board Developed Courses (excluding VET, Life Skills and Content Endorsed Courses)	Start teaching new Year 12 courses for English, Mathematics, Science and History Start implementing new Year 12 school- based assessment requirements for all Board Developed Courses (excluding VET, Life Skills and Content Endorsed Courses) Start implementing new HSC examination specifications	First HSC examinations for new English, Mathematics, Science and History courses

What materials will be provided to support implementation?

Many existing resources will continue to be useful and relevant. Teaching units will need modification to meet the requirements of the new syllabus.

Support materials will assist teachers in familiarisation and planning for implementation of the syllabus and assessment requirements. Program Builder, an online programming tool, will be available for teachers in Term 1, 2017.

Initial materials released with the syllabus include:

- · school-based assessment requirements
- assessment advice
- a parent guide to new syllabuses and assessment.

Additional materials to be released throughout 2017 include:

- sample scope and sequences
- sample teaching units
- · sample assessment schedules
- sample assessment tasks
- · advice on making adjustments for students with special education needs.

HSC Examination Specifications with sample materials will be released in Term 3, 2017.

The NSW Department of Education, the Catholic Education Commission NSW, the Association of Independent Schools of NSW and other school systems and professional teacher associations will continue to assist and support implementation of the syllabus.

How can I access the new Chemistry syllabus?

The Chemistry syllabus is available on the NESA website.

Features of Chemistry content pages

Content is organised in Years.

CHEMISTRY STAGE 6 - YEAR 12 - MODULE 5: EQUILIBRIUM AND ACID REACTIONS

MODULE 5: EQUILIBRIUM AND ACID REACTIONS

Home > Science > Chemistry Stage 6 > Course Content > Module 5: Equilibrium and Acid Reactions

Content is organised by module.

Outcomes

A student:

- > selects and processes appropriate qualitative and quantitative data and information using a range CH11/12-4 of appropriate media
- > analyses and evaluates primary and secondary data and information CH11/12-5
- > solves scientific problems using primary and secondary data, critical thinking skills and scientific CH11/12-6 processes
- > communicates scientific understanding using suitable language and terminology for a specific audience or purpose
- > explains the characteristics of equilibrium systems, and the factors that affect these systems CH12-12

The content focus and subheadings describe the scope of learning.

Working

Scienficially

skills relevant to

the module are

described.

Content Focus

Chemical systems may be open or closed. They include physical changes and chemical reactions that can result in observable changes to a system. Students study the effects of changes in temperature, concentration of chemicals and pressure on equilibrium systems, and consider that these can be predicted by applying Le Chatelier's principle. Students also analyse the quantitative relationship between products and reactants in equilibrium reactions to determine an equilibrium constant. From this calculation, they predict the equilibrium position, either favouring the formation of products or reactants in a chemical reaction.

This module also allows students to understand that scientific knowledge enables scientists to offer valid explanations and make reliable predictions. Students make reliable predictions by comparing equilibrium calculations and equilibrium constants to determine whether a combination of two solutions will result in the formation of a precipitate.

Content defines what students are expected to know and do.

Outcomes are

coded and linked

to content.

Working Scientifically

In this module, students focus on processing data to determine patterns and trends that enable them to solve/problems and communicate scientific understanding of ideas about equilibrium reactions. Students should be provided with opportunities to engage with all the Working Scientifically skills throughout the course.

Inquiry questions provide a focus for teaching and learning.

Key terms are

linked to the

glossary.

Static and Dynamic Equilibrium

Inquiry question: What happens when chemical reactions do not go through to completion?
Students:

- conduct practical investigations to analyse the reversibility of chemical reactions, for example:
 - cobalt(II) chloride hydrated and dehydrated
 - iron(III) nitrate and potassium thiocyanate
 - burning magnesium

Content

- burning steel wool (ACSCH090) ■
- model static and dynamic equilibrium and analyse the differences between open and closed systems (ACSCH079, ACSCH091)

Australian curriculum content is identified by codes.

Learning across the curriculum content is identified by icons.

Chemistry Stage 6: Guide to new NSW Syllabus