

2026 Queensland Quantum Challenge - Curriculum Alignment to Australian Curriculum V9 – Chemistry (for Year 11)

The Chemistry Rationale is bolded where there is alignment to the 2026 Queensland Quantum Challenge. The Unit/Syllabus Objectives included provide connections to domains where applications of quantum and advanced technologies are being harnessed to solve problems.

Chemistry Rationale

Chemistry is the study of materials and their properties and structure. In Unit 1, students study atomic theory, chemical bonding, and the structure and properties of elements and compounds. In Unit 2, students explore intermolecular forces, gases, aqueous solutions, acidity and rates of reaction. In Unit 3, students study equilibrium processes and redox reactions. **In Unit 4, students explore organic chemistry, synthesis and design to examine the characteristic chemical properties and chemical reactions displayed by different classes of organic compounds.**

Chemistry aims to develop students':

- interest in and appreciation of chemistry and its usefulness in helping to explain phenomena and solve problems encountered in their ever-changing world
- **understanding of the theories and models used to describe, explain and make predictions about chemical systems, structures and properties**
- **understanding of the factors that affect chemical systems and how chemical systems can be controlled to produce desired products**
- appreciation of chemistry as an experimental science that has developed through independent and collaborative research, and that has significant impacts on society and implications for decision-making
- expertise in conducting a range of scientific investigations, including the collection and analysis of qualitative and quantitative data, and the interpretation of evidence
- **ability to critically evaluate and debate scientific arguments and claims in order to solve problems and generate informed, responsible and ethical conclusions**
- **ability to communicate chemical understanding and findings to a range of audiences, including through the use of appropriate representations, language and nomenclature.**

Senior Chemistry

Unit / Syllabus Objectives

Subject Matter

Unit 4:
Structure,
synthesis and
design

Science as a human endeavour (SHE)

- Appreciate that the developments in computer modelling enabled more accurate visualisation and prediction of three-dimensional organic structures, such as proteins, which is critical in drug design and biotechnology.
- Consider that molecular manufacturing processes involve the positioning of molecules to facilitate a specific chemical reaction; such methods have the potential to synthesise specialised products, including proteins, carbon nanotubes, nanorobots and chemical sensors used in medicine.