



SAMPLE COURSE OUTLINE

CHEMISTRY
GENERAL YEAR 11

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Sample course outline

Chemistry – General Year 11

Unit 1

Science Inquiry Skills

Science Inquiry Skills align with the Science Understanding and Science as a Human Endeavour content of the unit and are integrated into the learning experiences.

- construct questions for investigation; propose hypotheses; and predict possible outcomes
- plan investigations, including the procedure/s to be followed, the materials required, and the type and amount of data to be collected; assess risk and address ethical issues associated with these methods
- conduct investigations, appropriate to the chosen context/s, safely, competently and methodically for the collection of reliable data
- represent data in meaningful and useful ways; organise and analyse data to identify trends, patterns and relationships; qualitatively describe sources of measurement error and inconsistencies in data; and use evidence to make and justify conclusions
- interpret a range of scientific and media texts, and evaluate the conclusions by considering the quality of available evidence
- construct and use appropriate representations, to communicate conceptual understanding, solve problems and make predictions
- communicate scientific ideas and information for a specific purpose using appropriate language, nomenclature and formats, including scientific reports

Week	Key teaching points
1–4	<p>Structure of the syllabus</p> <ul style="list-style-type: none"> • course outline • assessment outline <p>Properties of matter</p> <ul style="list-style-type: none"> • elements, compounds and homogeneous and heterogeneous mixtures • methods used to separate mixtures • chemical analysis can be used to identify additives in foods. Artificial colours can be detected and identified by paper chromatography. Advances in technology have led to the use of instrumental methods (SHE) • physical and chemical properties and changes <p>Task 1: Investigation – Assessing seaweed for chlorophyll using chromatography Task 2: Test – Properties of matter</p>
5–7	<p>States of matter</p> <ul style="list-style-type: none"> • properties of gases, liquids and solids in terms of the kinetic theory model • phase changes <p>Solutions and solubility</p> <ul style="list-style-type: none"> • the different solute/solvent combinations that form different types of solutions • the concept of solubility • water of suitable quality is essential for life. Drinking water should have sufficiently low levels of dissolved salts and microbes to meet the Australian drinking water guidelines and consumer and other regulatory requirements (SHE) • simple calculations in context, such as solubility and concentration (g/L and mL/L) • relationship between SI units and units in common usage • factors that affect solubility • analysis of food labelling to identify concentration scales used <p>Task 3: Practical – Laboratory report – Factors that affect solubility</p>

Week	Key teaching points
	Task 4: Extended response – Food labelling
8–11	<p>Atomic structure</p> <ul style="list-style-type: none"> the structure of matter can be modelled in terms of particles called atoms composed of protons, neutrons and electrons the differences between atoms, molecules and ions <p>The language of chemistry</p> <ul style="list-style-type: none"> symbols and names of common elements and the names of compounds appropriate to the chosen context(s) <p>Chemical reactions</p> <ul style="list-style-type: none"> conservation of mass during a chemical reaction chemical reactions can be represented using word equations <p>Task 5: Test – Atomic structure, the language of chemistry and chemical reactions</p>
12–15	<p>Reaction rates</p> <ul style="list-style-type: none"> qualitative description of reaction rates situations where the rates of chemical reactions are altered being able to speed up or slow down chemical reactions is important in everyday life and in industry. Changes in temperature, concentration of solution, surface area of solids and the presence of catalysts all affect the rates of reactions (SHE) <p>Task 6: Practical – Laboratory report – Measuring rates of reaction</p> <p>Task 7: Investigation – Factors affecting rates of food decay</p> <p>Task 8: Test – Reaction rates</p>

Unit 2

Science Inquiry Skills

Science Inquiry Skills align with the Science Understanding and Science as a Human Endeavour content of the unit and are integrated into the learning experiences.

- construct questions for investigation; propose hypotheses; and predict possible outcomes
- plan investigations, including the procedure/s to be followed, the materials required, and the type and amount of data to be collected; assess risk and address ethical issues associated with these methods
- conduct investigations, appropriate to the chosen context/s, safely, competently and methodically for the collection of reliable data
- represent data in meaningful and useful ways; organise and analyse data to identify trends, patterns and relationships; qualitatively describe sources of measurement error and inconsistencies in data; and use evidence to make and justify conclusions
- interpret a range of scientific and media texts, and evaluate the conclusions by considering the quality of available evidence
- construct and use appropriate representations, to communicate conceptual understanding, solve problems and make predictions
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Week	Key teaching points
1–4	<p>Analysis of aqueous solutions</p> <ul style="list-style-type: none"> • physical properties of water • indicators to identify substances (e.g. acids, bases, starch) • the pH scale • indicators and the pH scale <p>Task 9: Extended response – Natural factors affecting soil pH, effects of agricultural chemicals on soil pH, effects of soil pH on plant growth and methods to manage soil pH</p>
5–8	<p>Analysis of aqueous solutions</p> <ul style="list-style-type: none"> • physical and chemical analysis of solutions • solubility rules • ion colour to identify substances in chemical reactions • observations and word equations for acid-base and acid-carbonate reactions <p>Task 10: Practical test – Identifying properties of solutions and ions in solution</p> <p>Task 11: Test – Analysis of aqueous solutions</p>
9–11	<p>Aqueous solutions in action</p> <ul style="list-style-type: none"> • the cleaning action of soaps, detergents and shampoos • the use of soap in hard and soft water • there are advantages and disadvantages associated with the use of hard water (SHE) • biodegradability of soaps, detergents and shampoos <p>Task 12: Investigation – Comparing cleaning power of soaps and detergents</p> <p>Task 13: Test – Aqueous solutions in action</p>
12–15	<p>Aqueous solutions in action</p> <ul style="list-style-type: none"> • human activity impacts on waterways. Chemical monitoring and management assists in providing safe water for human use and to protect the habitats of other organisms (SHE) • the clean-up and remediation of oil spills • eutrophication • eutrophication can be caused by agricultural run-off carrying fertilisers into waterways. The increased growth of aquatic plants causes a variety of problems for fish and for recreational users of the waterway (SHE)

Week	Key teaching points
	<ul style="list-style-type: none">• formation of limestone caves or scale• limestone has been widely used as a building material. The benefits of using limestone as a building material should be considered against the negative aspects of quarrying and the susceptibility of limestone to acid rain (SHE) <p>Task 14: Extended response – Clean-up and remediation of oil spills</p> <p>Task 15: Investigation – Measuring nitrate, phosphate and biological oxygen demand in local water sources</p>