



Lesson Plans

Year 8 Science

Chapter 6 Elements & Compounds

Some general points about the following lesson plans:

- ★ The lesson plans outline only one way of sequencing the learning material in this chapter of the textbook.
- ★ The content and sequence will obviously vary from class to class (The following guide is ambitious in many instances).
- ★ All activities and investigations in each chapter have been deliberately designed to support the National Curriculum content whilst keeping in mind the development and reinforcement of skills required in the study of science in Year 11/12.
- ★ The length of lessons vary from school to school and even within schools. The following guide is based on 35/40 min lessons because it was reasoned that adjustment to 60/75/90 mins lessons would be easier than reducing lesson plans.
- ★ Students may be challenged further by completing each chapter Task, Competition Questions, Challenges, and by finding and entering any of the many competitions, challenges, projects etc that may be found on the Internet. Such students may benefit by doing an Internet search early in the year and planning entries before they close.

Assessment

A Task
Inquiry Report
End of Unit Test

Content Description (4 weeks)

Chapter 6

Differences between elements, compounds and mixtures can be described at a particle level (ACSSU152)

- ★ model the arrangement of particles in elements and compounds
- ★ recognise that elements and simple compounds can be represented by symbols and formulas
- ★ locate elements on the periodic table

Content strands

The Australian Curriculum: Science has three interrelated strands: Science Understanding, Science as a Human Endeavour and Science Inquiry Skills.

Science as a Human Endeavour

Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people's understanding of the world (ACSHE134)

- investigating developments in the understanding of cells and how this knowledge has impacted on areas such as health and medicine
- discovering how people's understanding of the nature of matter has changed over time as evidence for particle theory has become available through developments in technology
- considering how the idea of elements has developed over time as knowledge of the nature of matter has improved
- investigating the development of the microscope and the impact it has had on the understanding of cell functions and division

Science knowledge can develop through collaboration and connecting ideas across the disciplines of science (ACSHE226)

- investigating how knowledge of the location and extraction of mineral resources relies on expertise from across the disciplines of science
- considering how advances in technology, combined with scientific understanding of the functioning of body systems, has enabled medical science to replace or repair organs
- researching the use of reproductive technologies and how developments in this field rely on scientific knowledge from different areas of science

Use and influence of science

Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations (ACSHE135)

- investigating requirements and the design of systems for collecting and recycling household waste
- investigating strategies implemented to maintain part of the local environment, such as bushland, a beach, a lake, a desert or a shoreline
- investigating how energy efficiency can reduce energy consumption
- investigating the development of vehicles over time, including the application of science to contemporary designs of solar-powered vehicles
- discussing ethical issues that arise from organ transplantation

Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management (ACSHE136)

- describing how technologies have been applied to modern farming techniques to improve yields and sustainability
- investigating how Aboriginal people recognise relationships in ecosystems by burning to promote new growth, attract animals and afford easier hunting and food gathering
- describing the impact of plant cloning techniques (asexual production) in agriculture such as horticulture, fruit production and vineyards
- investigating the role of science in the development of technology important to the economies and communities of the Asia-Pacific regions, for example car manufacture, earthquake prediction and electronic optics

People use understanding and skills from across the disciplines of science in their occupations (ACSHE227)

- recognising the role of knowledge of the environment and ecosystems in a number of occupations
- considering how engineers improve energy efficiency of a range of processes
- recognising the role of knowledge of cells and cell divisions in the area of disease treatment and control
- investigating how scientists have created new materials such as synthetic fibres, heat-resistant plastics and pharmaceuticals

Science Inquiry Skills

Science inquiry involves identifying and posing questions; planning, conducting and reflecting on investigations; processing, analysing and interpreting evidence; and communicating findings. This strand is concerned with evaluating claims, investigating ideas, solving problems, drawing valid conclusions and developing evidence-based arguments.

Chapter 6 Elements & Compounds (4 weeks)

Lesson	Method	Resources
1	<ul style="list-style-type: none"> <input type="checkbox"/> General (covering book, ruling pages, paste study guide etc.) <input type="checkbox"/> Purpose of chapter <input type="checkbox"/> Introduce/discuss The periodic table of elements <input type="checkbox"/> Discuss/Internet: What is chemistry? Why is chemistry important? <input type="checkbox"/> HW: Chemistry and cooking 	Internet
2	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss: What is an element p126 <input type="checkbox"/> Sketch a hydrogen atom, an oxygen atom, a water molecule (which are elements, which are molecules?) <input type="checkbox"/> Exercise p126 <input type="checkbox"/> HW: Complete exercise as necessary 	
3	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Sketch a hydrogen atom, oxygen atom, water molecule <input type="checkbox"/> Internet: Search for images of hydrogen and oxygen atoms to see how others sketch the atoms <input type="checkbox"/> Discuss: How to separate hydrogen and oxygen atoms from water molecule <input type="checkbox"/> Discuss: Electrolysis <input type="checkbox"/> Internet: Online video of electrolysis <input type="checkbox"/> HW: What is electrolysis? 	Internet
4	<ul style="list-style-type: none"> <input type="checkbox"/> Activity: Electrolysis of water p127 <input type="checkbox"/> Exercise p127 <input type="checkbox"/> Internet: Test for oxygen and hydrogen (Challenge p127) <input type="checkbox"/> HW: Complete exercise as necessary 	Electrolysis equipment
5	<ul style="list-style-type: none"> <input type="checkbox"/> Test: What is electrolysis? <input type="checkbox"/> Discuss: Atoms p128 <input type="checkbox"/> Discuss: Rutherford experiment p128 <input type="checkbox"/> Internet: Online videos about 'atom', 'atomic theory', 'protons and electrons' <input type="checkbox"/> Exercise p128 <input type="checkbox"/> HW: Complete exercise as necessary 	Internet
6	<ul style="list-style-type: none"> <input type="checkbox"/> Test: What is atomic number? Sketch hydrogen atom <input type="checkbox"/> Discuss: Flame tests p129 <input type="checkbox"/> Internet: Flame test <input type="checkbox"/> Exercise p129 <input type="checkbox"/> HW: Complete exercise as necessary, purpose of flame tests 	Internet
7	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Sketch oxygen atom, what is flame test?, purpose flame test <input type="checkbox"/> Activity: Flame tests p129 	Various compounds, burner, paperclips, tongs, etc
8	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Sketch water molecule, what is an element?, what is atomic number? <input type="checkbox"/> Sketch and label atoms of helium, lithium, beryllium, boron, carbon. Also describe properties of these elements <input type="checkbox"/> HW: Sketch and label the nitrogen atom 	

Chapter 6 Elements & Compounds (4 weeks)

Lesson	Method	Resources
9	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss: Properties of elements: hydrogen p131 <input type="checkbox"/> Discuss: Molecules p131 <input type="checkbox"/> Sketch a molecule of hydrogen <input type="checkbox"/> Internet: What does a molecule of oxygen look like? <input type="checkbox"/> Exercise p131 <input type="checkbox"/> HW: Complete exercise as necessary 	Internet
10	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss: The periodic table p132 <input type="checkbox"/> Activity: Draw a wallchart of the first 18 elements p132 <input type="checkbox"/> HW: Complete wallchart as necessary 	Internet
11	<ul style="list-style-type: none"> <input type="checkbox"/> Learn names of the first 18 elements - repeat as necessary p132 <input type="checkbox"/> Learn the symbols of the first 18 elements - repeat as necessary p132 <input type="checkbox"/> Exercise p132 <input type="checkbox"/> HW: Revise names and symbols of first 18 elements 	
12	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Names and symbols of first 18 elements <input type="checkbox"/> Discuss: The periodic table p133 <input type="checkbox"/> Activity: Construct a periodic table of all elements p133 <input type="checkbox"/> Exercise p133 <input type="checkbox"/> HW: Complete exercise and revise names/symbols of first 18 elements 	
13	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Names/symbols of first 18 elements <input type="checkbox"/> Discuss: Compounds p134 <input type="checkbox"/> Discuss: Compounds and their uses p135 <input type="checkbox"/> Exercise p135 <input type="checkbox"/> HW: Complete exercise as necessary 	
14	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss: Science knowledge - Alchemy p136 <input type="checkbox"/> Exercise p136 <input type="checkbox"/> Discuss: Science knowledge - DNA p137 <input type="checkbox"/> Exercise p137 <input type="checkbox"/> HW: Complete exercises as necessary 	Posters, Internet, pens etc

Chapter 6 Elements & Compounds (4 weeks)

Lesson	Method	Resources
15	Science inquiry <input type="checkbox"/> Group selection of an inquiry question from p139 <input type="checkbox"/> Group conduction of an investigation to answer the question.	
16	<input type="checkbox"/> Continuation of investigation <input type="checkbox"/> Write report (samples on p21 and p25) <input type="checkbox"/> HW: Complete report as required	
17	Chapter Review and Task <input type="checkbox"/> Exercise p140 <input type="checkbox"/> Puzzles p141 <input type="checkbox"/> Begin work on 'A Task' p125 <input type="checkbox"/> HW: Complete exercises & work on task as required	
18	Chapter Review and Task <input type="checkbox"/> Exercise p142 <input type="checkbox"/> Continue work on 'A Task' p125 <input type="checkbox"/> HW: Complete exercises & work on task as required	
19	Chapter Review and Task <input type="checkbox"/> Competition questions p143 <input type="checkbox"/> Harder test questions p144 <input type="checkbox"/> Preparation for test <input type="checkbox"/> Continue work on 'A Task' p125 <input type="checkbox"/> HW: Complete exercises & work on task as required	
20	<input type="checkbox"/> End of chapter/unit test	