



# Lesson Plans

## Year 7 Science

## Chapter 4 Mixtures

### 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  
Practical Report  
End of Unit Test

## Content Description (4 weeks)

### Chapter 4 Mixtures

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

- ★ Recognise the differences between pure substances and mixtures and identify examples of each.
- ★ Identify the solvent and solute in solutions.
- ★ Investigate and use a range of physical separation techniques such as filtration, decantation, evaporation, crystallisation, chromatography and distillation.
- ★ Explore and compare separation methods used in the home.

## Content strands

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

Together, the three strands of the science curriculum provide students with understanding, knowledge and skills through which they can develop a scientific view of the world. Students are challenged to explore science, its concepts, nature and uses through clearly described inquiry processes.

### Science Understanding

Science understanding is evident when a person selects and integrates appropriate science knowledge to explain and predict phenomena, and applies that knowledge to new situations. Science knowledge refers to facts, concepts, principles, laws, theories and models that have been established by scientists over time.

The **chemical sciences** sub-strand is concerned with understanding the composition and behaviour of substances. The key concepts developed within this sub-strand are that: the chemical and physical properties of substances are determined by their structure at an atomic scale; and that substances change and new substances are produced by rearranging atoms through atomic interactions and energy transfer. In this sub-strand, students classify substances based on their properties, such as solids, liquids and gases, or their composition, such as elements, compounds and mixtures. They explore physical changes such as changes of state and dissolving, and investigate how chemical reactions result in the production of new substances. Students recognise that all substances consist of atoms which can combine to form molecules, and chemical reactions involve atoms being rearranged and recombined to form new substances. They explore the relationship between the way in which atoms are arranged and the properties of substances, and the effect of energy transfers on these arrangements.

### 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.

### Science as a Human Endeavour

Through science, humans seek to improve their understanding and explanations of the natural world. Science involves the construction of explanations based on evidence and science knowledge can be changed as new evidence becomes available. Science influences society by posing, and responding to, social and ethical questions, and scientific research is itself influenced by the needs and priorities of society. This strand highlights the development of science as a unique way of knowing and doing, and the role of science in contemporary decision making and problem solving. It acknowledges that in making decisions about science practices and applications, ethical and social implications must be taken into account. This strand also recognises that science advances through the contributions of many different people from different cultures and that there are many rewarding science-based career paths.

### Science across Foundation to Year 12

Years 7–10, typically students from 12 to 15 years of age, Curriculum focus: explaining phenomena involving science and its applications

During these years, students continue to develop their understanding of important science concepts across the major science disciplines. It is important to include contemporary contexts in which a richer understanding of science can be enhanced. Current science research and its human application motivates and engages students.

Within the outlined curriculum, students should undertake some open investigations that will help them refine their science inquiry skills. The quantitative aspects of students' inquiry skills are further developed to incorporate consideration of uncertainty in measurement. In teaching the outlined curriculum, it is important to provide time to build the more abstract science ideas that underpin understanding.

## Chapter 4 Mixtures (4 weeks)

Lesson	Method	Resources
1	<ul style="list-style-type: none"> <li><input type="checkbox"/> General (covering book, ruling pages, etc.)</li> <li><input type="checkbox"/> Purpose of chapter</li> <li><input type="checkbox"/> Introduce/discuss Mixtures p72</li> <li><input type="checkbox"/> Exercise p75</li> <li><input type="checkbox"/> HW: Complete exercise</li> </ul>	
2	<ul style="list-style-type: none"> <li><input type="checkbox"/> Introduce/discuss Solutions p76</li> <li><input type="checkbox"/> Activity: How much will dissolve? p76</li> <li><input type="checkbox"/> HW: Internet Dissolving sugar warmer vs cooler water p76</li> </ul>	How much will dissolve activity p76
3	<ul style="list-style-type: none"> <li><input type="checkbox"/> Discuss Solutions p77</li> <li><input type="checkbox"/> Word Bank p77</li> <li><input type="checkbox"/> Internet: Folding filter paper</li> <li><input type="checkbox"/> Activity: Solution through filter p77</li> <li><input type="checkbox"/> Exercise: p77</li> <li><input type="checkbox"/> HW: Complete exercise</li> </ul>	Internet Solution through filter activity p77
4	<ul style="list-style-type: none"> <li><input type="checkbox"/> Introduce/discuss Suspensions p78</li> <li><input type="checkbox"/> Activity: Compare suspension and solution p78</li> <li><input type="checkbox"/> Exercise: Q1-3 p79</li> <li><input type="checkbox"/> HW: Complete exercise p79 Q1-3</li> </ul>	Compare suspension and solution p78
5	<ul style="list-style-type: none"> <li><input type="checkbox"/> Introduce/Discuss Colloids p79</li> <li><input type="checkbox"/> Activity: Solution or colloid or suspension p79</li> <li><input type="checkbox"/> Exercise Q4-7 p79</li> <li><input type="checkbox"/> HW: Complete exercise p79</li> </ul>	Solution or colloid or suspension activity p79
6	<ul style="list-style-type: none"> <li><input type="checkbox"/> Introduce/discuss Separating mixtures p80</li> <li><input type="checkbox"/> Activity: Decanting p81</li> <li><input type="checkbox"/> Internet: Decanting p81</li> <li><input type="checkbox"/> Word Bank: Decanting, centrifuge, filtration</li> </ul>	Decanting activity p81 Internet
7	<ul style="list-style-type: none"> <li><input type="checkbox"/> Discuss Separating mixtures p80</li> <li><input type="checkbox"/> Internet: Filtration p81</li> <li><input type="checkbox"/> Activity: Filtering p81</li> </ul>	Filtering activity p81 Internet
8	<ul style="list-style-type: none"> <li><input type="checkbox"/> Discuss Separating mixtures p82</li> <li><input type="checkbox"/> Internet: 'centrifuging blood', 'Cleaning aquarium water', 'hard to breathe in a centrifuge' p82</li> <li><input type="checkbox"/> Complete Word Bank p82</li> <li><input type="checkbox"/> Exercise p82</li> <li><input type="checkbox"/> HW: Complete exercise p82</li> </ul>	Internet

## Chapter 4 Mixtures (4 weeks)

Lesson	Method	Resources
9	<input type="checkbox"/> Discuss Purifying water p83 <input type="checkbox"/> Internet: Sedimentation tanks p83 <input type="checkbox"/> Internet: Distillation <input type="checkbox"/> Internet: Other methods of treating water <input type="checkbox"/> Activity: Purifying water p83	Internet Purifying water p83
10	<input type="checkbox"/> Activity: Leave sugar water to evaporate p84 <input type="checkbox"/> Activity: Filter salt water p84 <input type="checkbox"/> Discuss Evaporation Distillation p84 <input type="checkbox"/> HW: Internet 'solar distillers', 'home distillers' p84 Read activities p85	Activities p84
11	<input type="checkbox"/> Activity: Evaporation p85 <input type="checkbox"/> Activity: Distillation p85	
12	<input type="checkbox"/> Discuss Separating solids p86 <input type="checkbox"/> 4 ways of separating a solid p86 <input type="checkbox"/> Discuss Separating colours p87 <input type="checkbox"/> Activity: Chromatography p87 <input type="checkbox"/> Internet: 'Froth flotation', 'Chemical engineer', Chromatography'	Chromatography activity p87
13	Science inquiry <input type="checkbox"/> Group selection of a question from the bottom of pages 88 and 89 <input type="checkbox"/> Group conduction of an investigation to answer the question.	
14	<input type="checkbox"/> Continuation of investigation <input type="checkbox"/> Write report (samples on p21 and p25) <input type="checkbox"/> HW: Complete report as required	
15	Chapter Review and Task <input type="checkbox"/> Exercises p90 and p91 <input type="checkbox"/> Begin work on 'A Task' p73 <input type="checkbox"/> HW: Complete exercises & work on task as required	
16	Chapter Review and Task <input type="checkbox"/> Exercises p92 and A couple of puzzles p93 <input type="checkbox"/> Continue work on 'A Task' p73 <input type="checkbox"/> HW: Complete exercises & work on task as required	Internet
17	Chapter Review and Task <input type="checkbox"/> Exercises p94 <input type="checkbox"/> Begin work on 'A Task' p73 <input type="checkbox"/> HW: Complete exercises & work on task as required	
18	Chapter Review and Task <input type="checkbox"/> Competition Questions p95 <input type="checkbox"/> Begin work on 'A Task' p73 <input type="checkbox"/> HW: Complete exercises & work on task as required	
19	Chapter Review and Task <input type="checkbox"/> Harder Test Questions p96 <input type="checkbox"/> Begin work on 'A Task' p73 <input type="checkbox"/> HW: Complete exercises & work on task as required	
20	<input type="checkbox"/> End of Chapter / End of Unit Test	