



Lesson Plans

Year 8 Science

Chapter 5 Matter

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 5

The properties of the different states of matter can be explained in terms of the motion and arrangement of particles (ACSSU151)

- ★ explain why a model for the structure of matter is needed
- ★ model the arrangement of particles in solids, liquids and gases
- ★ use the particle model to explain observed phenomena linking the energy of particles to temperature changes

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 5 Matter (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 Matter p103 <input type="checkbox"/> Activity: p103 <input type="checkbox"/> HW: Think of reason for different layers in activity. Other materials? 	Beaker, honey, oil, water etc
2	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss: What is matter? Three states of matter p104 <input type="checkbox"/> Discuss: Solids p104 <input type="checkbox"/> Internet: Online video of property of solids <input type="checkbox"/> Activity: Volume and shape of a solid p104 <input type="checkbox"/> HW: Properties of solids 	Variety of solids Measuring cylinder, cotton/string Internet
3	<ul style="list-style-type: none"> <input type="checkbox"/> Challenge: Solids p105 <input type="checkbox"/> Discuss: Liquids p105 <input type="checkbox"/> Internet: Online video of property of liquids <input type="checkbox"/> Activity: Volume and shape of a liquid p105 <input type="checkbox"/> HW: Properties of liquids 	Internet Variety of liquids Measuring cylinder
4	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss: Gases p105 <input type="checkbox"/> Internet: Online video of property of gases <input type="checkbox"/> Activity: Volume and shape of a gas p105 <input type="checkbox"/> Exercise: p105 <input type="checkbox"/> HW: Complete exercise as necessary Challenge: Steam p105 	Internet Plastic bottle and cap
5	<ul style="list-style-type: none"> <input type="checkbox"/> Test: What is matter? Properties of solids, liquids, gases. <input type="checkbox"/> Discuss: Density p106 <input type="checkbox"/> Internet: Online video of density <input type="checkbox"/> Discuss: Density of different matter p106 <input type="checkbox"/> Challenge: Density after heating? The density of feathers p106 <input type="checkbox"/> HW: Density of feathers 	Internet
6	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss: Calculating density p107 <input type="checkbox"/> Formula for density p107 <input type="checkbox"/> Repeat examples of density calculations without looking <input type="checkbox"/> Activity: Calculate density of object p107 <input type="checkbox"/> HW: Memorise density formula with units 	Solid object Measuring cylinder, cotton/string Digital scales Calculator
7	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Density problem <input type="checkbox"/> Internet: Examples of density calculations <input type="checkbox"/> Exercise p107 <input type="checkbox"/> HW: Complete exercise as necessary 	Internet
8	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Density problem and properties of matter <input type="checkbox"/> Discuss: The particle model <input type="checkbox"/> Activity: Particles of matter move p108 <input type="checkbox"/> Activity: Spaces between particles p108 <input type="checkbox"/> List the basic points of the particle model of matter p109 <input type="checkbox"/> HW: The particle model 	Perfume Rice and flour

Chapter 5 Matter (4 weeks)

Lesson	Method	Resources
9	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss Particles of a solid <input type="checkbox"/> Internet: Watch online videos of particles of a solid <input type="checkbox"/> Discuss Particles of a liquid <input type="checkbox"/> Internet: Watch online videos of particles of a liquid <input type="checkbox"/> Discuss Particles of a solid <input type="checkbox"/> Internet: Watch online videos of particles of a gas <input type="checkbox"/> Sketch examples of particles of solid, liquid, and gas <input type="checkbox"/> HW: Particle model of solid, liquid, and gas p109 	Internet
10	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss: Change of state <input type="checkbox"/> Discuss: Particle model explanation of melting p110 <input type="checkbox"/> Discuss: Particle model explanation of boiling p110 <input type="checkbox"/> Activity: Change of state p111 <input type="checkbox"/> HW: Particle model explanation of melting and boiling 	Beaker, thermometer, burner, tripod, etc
11	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Particle model explanation of melting and boiling <input type="checkbox"/> Discuss: Sublimation p111 <input type="checkbox"/> Exercise p111 <input type="checkbox"/> HW: Complete exercise as necessary 	
12	<ul style="list-style-type: none"> <input type="checkbox"/> Test: particle model explanation of melting and boiling <input type="checkbox"/> Discuss: Particle model explanation of expansion <input type="checkbox"/> Discuss: Particle model explanation of contraction <input type="checkbox"/> Activity: Spaces between particles p113 <input type="checkbox"/> HW: Online videos of 'crush a can' p113 	Plastic bottle with lid, hot water Internet
13	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Particle model explanation of melting, boiling, expansion, contraction <input type="checkbox"/> Word bank p113 <input type="checkbox"/> Exercise p113 <input type="checkbox"/> HW: Complete exercise as necessary Revise density 	Internet
14	<ul style="list-style-type: none"> <input type="checkbox"/> Test: Density problems <input type="checkbox"/> Science knowledge p114 <input type="checkbox"/> Exercise p114 <input type="checkbox"/> Science knowledge p115 <input type="checkbox"/> Exercise p115 <input type="checkbox"/> HW: Complete exercises as necessary 	Posters, Internet, pens etc

Chapter 5 Matter (4 weeks)

Lesson	Method	Resources
15	Science inquiry <input type="checkbox"/> Group selection of an inquiry question from p117 <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"/> Exercises p118 and p119 <input type="checkbox"/> Begin work on 'A Task' p103 <input type="checkbox"/> HW: Complete exercises & work on task as required	
18	Chapter Review and Task <input type="checkbox"/> Exercises p120 and p122 <input type="checkbox"/> Continue work on 'A Task' p103 <input type="checkbox"/> HW: Complete exercises & work on task as required	
19	Chapter Review and Task <input type="checkbox"/> Competition questions p119 <input type="checkbox"/> Harder test questions p122 <input type="checkbox"/> Preparation for test <input type="checkbox"/> Continue work on 'A Task' p103 <input type="checkbox"/> HW: Complete exercises & work on task as required	
20	<input type="checkbox"/> End of chapter/unit test	