Lesson Plans

Year 8 Science

Chapter 9
Minerals

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 (2 weeks)

Chapter 9

Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales (ACSSU153)

- ★ recognise that rocks are a collection of different minerals
- ★ recognise that some rocks and minerals, such as ores, provide valuable resources
- ★ consider the role of forces and energy in the formation of different types of rocks and minerals

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 9 Minerals (2 weeks)

Lesson	Method	Resources
1	□ General (covering book, ruling pages, paste study guide etc.) □ Purpose of chapter □ Introduce/discuss Minerals p191 □ Discuss: Stone age, bronze age, iron age p191 □ Internet: Online video of prehistoric copper smelting p191 □ HW: A couple of puzzles p203	Internet8
2	□ Discuss: Minerals p192 □ Discuss: Mineral identification p193 □ Discuss: Moh's hardness scale p193 □ Internet: Online videos 'Moh's hardness scale' □ Activity: Mineral hardness p193 □ Exercise p193 □ HW: Complete exercise as necessary	Internet Variety of minerals, knife, bathroom tile
3	□ Discuss: Minerals and crystal structure p194 □ Internet: Online videos growing crystals p195 □ Activity: Grow salt and vinegar crystals p195 □ Exercise p195 □ HW: Complete exercise as necessary	Internet Salt, vinegar, food colour-ing, dish, cup, sponge
4	□ Test: What is a mineral, mineral identification □ Discuss: Mineral ore p196 □ Activity: Try to memorise some mineral ores and their chemical formula □ Discuss: Mining p197 □ Internet: Online videos of ore deposits and mining p197 □ Exercise p197 □ HW: Complete exercise as necessary, revise mining	Internet
5	□ Test: What is a mineral, mineral identification, mining □ Discuss: Metal extraction p198 □ Activity: Make a copper ore rock p199 □ Internet: Online video copper extraction □ HW: Revise metal extraction	Copper carbon-ate, sand, gap filler powder Internet
6	□ Test: What is a mineral, mineral identification, mining, metal extraction □ Activity: Extracting copper from copper ore p199 □ Exercise p199 □ HW: Complete exercise as necessary, Challenge p199	mortar & pestle, dilute H_2SO_4, dilute NaOH, filter equipment
7	□ Start work on 'A Task' p191 □ Science knowledge - Prospecting p200 □ Exercise p200 □ Science knowledge - Drones p201 □ Exercise p201 □ HW: Complete exercises as necessary	Internet
8	Chapter Review and Task □ Exercises p202 and p204 □ Continue work on 'A Task' p191 □ HW: Complete exercises & work on task as required	
9	Chapter Review and Task □ Competition questions p205 □ Harder test questions p206 □ Preparation for test □ Continue work on 'A Task' p191 □ HW: Complete exercises & work on task as required	
10	□ End of chapter/unit test	