Lesson Plans

Year 8 Science Chapter 1
Science Inquiry Skills

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

Inquiry Report

Content Description (1 week)

Chapter 1
Questioning and predicting: Formulate questions or hypotheses that can be investigated scientifically (ACSIS164)
Planning and conducting: Plan, select and use appropriate investigation methods, include field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods (ACSIS165). Select and use appropriate equipment, include digital technologies, to systematically and accurately collect and record data (ACSIS166)
Processing and analysing data and information: Analyse patterns and trends in data, include describe relationships between variables and identifye inconsistencies (ACSIS169)
Use knowledge of scientific concepts to draw conclusions that are consistent with evidence (ACSIS170)
Evaluating: Evaluate conclusions, include identifye sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data (ACSIS171). Critically analyse the validity of information in secondary sources and evaluate the approaches used to solve problems (ACSIS172)
Communicating: Communicate scientific ideas and information for a particular purpose, include constructe evidence-based arguments and use appropriate scientific language, conventions and representations (ACSIS174)

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 1 Science Inquiry Skills (1 week)

Lesson	Method	Resources
1	☐ General (covering book, ruling pages, paste study guide etc.) ☐ Purpose of chapter ☐ Introduce/discuss Science inquiry p2 ☐ Activity: Bounce a golf ball from 100 cm p3 ☐ Discuss: Questioning p4 ☐ Exercise p4 ☐ HW: Complete report of golf ball bounce	Golf ball, tape measure
2	☐ Discuss: Predicting p6 ☐ Exercises p6 ☐ Discuss: Planning p8 and Conducting p9 ☐ Activity: Select an activity from p7-9 ☐ HW: Complete report of activity	Equipment for activity selected
3	☐ Discuss: Measuring p10 ☐ Activity: Memorise units and conversion of length p10 and volume p11 ☐ Exercise p10 and p11 ☐ Activity: Memorise units and conversion of mass p12, temperature p13, and time p13 ☐ Exercise p12 and p13 ☐ HW: Complete exercises as necessary	
4	☐ Discuss: Processing p14 ☐ Exercise p15 ☐ Discuss: Analysing p16 ☐ Exercise p17 ☐ Discuss: Technology p18 and p19 ☐ Activity: Graph the data p18 and p19 using graphing tools available ☐ HW: Complete exercises as necessary	
5	☐ Discuss: Evaluating and communicating p20 ☐ Chapter review p22 ☐ Exercise on Science Inquiry p26 ☐ HW: Complete exercise as necessary	