Lesson Plans

Year 7 Science

Chapter 7
Water Cycle

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 (3 weeks)

Chapter 7

Water is an important resource that cycles through the environment (ACSSU222).

- ★ Consider the water cycle in terms of changes of state of water.
- ★ Investigate factors that influence the water cycle in nature.
- ★ Explore how human management of water impacts on the water cycle.

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 (ACSHE119)

- investigating how advances in telescopes and space probes have provided new evidence about space
- researching different ideas used in the development of models of the solar system developed by scientists such as Copernicus, Khayyám and Galileo
- researching developments in the understanding of astronomy, such as the predictions of eclipses and the calculation of the length of the solar year by Al-Battani in the tenth century

Science knowledge can develop through collaboration and connecting ideas across the disciplines of science (ACSHE223)

- considering how water use and management relies on knowledge from different areas of science, and involves the application of technology
- identifying the contributions of Australian scientists to the study of human impact on environments and to local environmental management projects
- investigating how land management practices of Aboriginal and Torres Strait Islander peoples can help inform sustainable management of the environment
- studying transnational collaborative research in the Antarctic
- recognising that traditional and Western scientific knowledge can be used in combination to care for Country and Place

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 (ACSHE120)

- relating regulations about wearing seatbelts or safety helmets to knowledge of forces and motion
- considering issues relating to the use and management of water within a community
- considering decisions made in relation to the recycling of greywater and blackwater
- considering how human activity in the community can have positive and negative effects on the sustainability of ecosystems
- investigating ways to control the spread of the cane toad

Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management (ACSHE121)

- investigating everyday applications of physical separation techniques such as filtering, sorting waste materials, reducing pollution, extracting products from plants, separating blood products and cleaning up oil spills
- investigating how advances in science and technology have been applied to the treatment of water in industrial and household systems
- investigating how Aboriginal and Torres Strait Islander knowledge is being used to inform scientific decisions, for example care of waterways
- researching the different scientific responses to the rabbit plagues in Australian agricultural areas

People use understanding and skills from across the disciplines of science in their occupations (ACSHE224)

- recognising that water management plays a role in areas such as farming, land management and gardening
- investigating how separation techniques are used in the food and wine industries
- considering how seasonal changes affect people in a variety of activities such as farming
- considering how sports scientists apply knowledge of forces in order to improve performance

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 7 Water Cycle (3 weeks)

Lesson	Method	Resources
1	□ General (covering book, ruling pages, paste study guide etc.) □ Purpose of chapter □ Introduce/discuss: Water Cycle p151 □ Discuss: History of watery cycle p151 □ Discuss: Importance/shortage of water/introduce task p151 □ HW: Thoughts about task p151	
2	□ Discuss: The water cycle p152 and change of state of water □ Activity: Begin sketch of water cycle top right p152 □ Activity: Model of water cycle p152 □ HW: Where did the water on Mars go?	Equipment for model of water cycle Internet
3	□ Test: Water cycle, change of state of water □ Discuss: Water p153 □ Discuss: The mass of 1L of water, mass of 1 m^3 of water, mass of 1km^3 of water □ Internet: Lake Baikal p153 □ Exercise p153 □ HW: Complete exercise as necessary, Revise water cycle	Internet
4	□ Test: Water cycle, change of state of water □ Discuss: The particle theory and solid water p154 □ Internet: Online videos of ice crystals forming. □ Internet: Online videos of snow crystals □ Activity: Three states of water p155 □ HW: Revise particle theory of matter	Equipment for 3 states of water activity
5	□ Test: States of water and the particle theory □ Discuss: Particle theory and liquid water p155 □ Discuss: Particle theory and vapour p155 □ Exercise p155 □ HW: Complete exercise as necessary and revise states of water	
6	□ Test: States of water and the particle theory □ Discuss: Evaporation and the water cycle p156 □ Activity: Add evaporation to the diagram of the water cycle p156 □ Activity: Evaporation (3 beakers of water) p156 □ HW: Revise states of water	Beakers and water
7	□ Test: States of water and the water cycle □ Discuss: Condensation and the water cycle p157 □ Activity: Add condensation to the diagram of the water cycle p157 □ Activity: Condensation p157 □ Exercise p157 □ HW: Complete exercise as necessary and revise water cycle	Beakers, thermometer, ice
8	□ Test: States of water and the water cycle □ Discuss: Precipitation and the water cycle p158 □ Activity: Add precipitation to the diagram of the water cycle p158 □ Activity: Memorise the names of 10 types of cloud □ HW: Revise water cycle and 10 types of cloud	Internet

Chapter 7 Water Cycle (3 weeks)

Lesson	Method	Resources
9	Test: States of water and the water cycle Discuss: Runoff, infiltration, subsurface flow p159 Activity: Add runoff, infiltration, subsurface flow to the water cycle Internet: The great artesian basin p159 Exercise p159 HW: Complete exercise as necessary, revise complete water cycle	Review previous activity on evaporation 3 beakers
10	Test: Sketch and label the water cycle Discuss: Human activity on the water cycle p160 Activity: Soil infiltration p160 Activity: Graph results of previous activity of 3 beaker evaporation p156 Exercise p161 HW: Water cycle and human activity	variety of soils, filter equipment
11	Science inquiry Group selection of an inquiry question from p163 Group conduction of an investigation to answer the question.	
12	Continuation of investigation Write report (samples on p21 and p25) HW: Complete report as required	
13	Chapter Review and Task Exercise p164 and p165 Puzzles p167 Begin work on 'A Task' p151 HW: Complete exercises & work on task as required	
14	Chapter Review and Task Exercise p166 and p168 Continue work on 'A Task' p169 HW: Complete exercises & work on task as required	
15	Chapter Review and Task Competition questions p169 Harder test questions p170 Preparation for test Continue work on 'A Task' p151 HW: Complete exercises & work on task as required	
16	End of chapter/unit test	