Lesson Plans

Year 7 Science

Chapter 9 Gravity

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

Earth's gravity pulls objects towards the centre of the Earth (ACSSU118).

- ★ Explore how gravity affects objects on the surface of Earth.
- ★ Consider how gravity keeps planets in orbit around the Sun.

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 9 Gravity (2 weeks)

Lesson	Method	Resources
1	General (covering book, ruling pages, paste study guide etc.) Purpose of chapter Introduce/discuss: Gravity p201 Discuss: History of gravity p201 Activity: Draw an ellipse - the path of planets around the sun caused by gravitational forces p201 Discuss: Gravity in everyday life HW: Thoughts about task p201	String, pins, pencil
2	Discuss: Gravity on earth p202 Discuss: Mass and weight p202 Internet: Online videos on mass and weight p202 Exercise p203 HW: Complete exercise as necessary, revise gravity, prepare activity	Internet
3	Test: Gravity Activity: Measure gravity on Earth p203 Internet: Value of Earth's gravity p203 HW: Complete activity report as necessary, revise gravity	Pendulum equipment Internet
4	Test: Gravity Activity: Two objects p204 Activity: Effects gravity on large objects p205 Activity: Weight on the moon p204 Exercise p205 HW: Complete exercise as necessary	Equipment for activities Internet
5	Test: Gravity Discuss: Solar system gravity p206 Internet: Tour the solar system p206 Internet: Solar system gravity simulator p206 Activity: Model a planet's orbit p207 Exercise p207 HW: Complete exercise as necessary and revise gravity	Internet Equipment to model planet orbit

Chapter 9 Gravity (2 weeks)

Lesson	Method	Resources
6	Science inquiry • Group selection of an inquiry question from p208/209 • Group conduction of an investigation to answer the question. • Activity: Complete word bank p207	
7	• Continuation of investigation • Write report (samples on p21 and p25) • HW: Complete report as required	
8	Chapter Review and Task • Exercise p210 • Puzzles p211 • Begin work on 'A Task' p201 • HW: Complete exercises & work on task as required	
9	Chapter Review and Task • Exercise p212 • Continue work on 'A Task' p201 • HW: Complete exercises & work on task as required	
10	Chapter Review and Task • Competition questions p213 • Harder test questions p214 • Preparation for test • Continue work on 'A Task' p201 • HW: Complete exercises & work on task as required	
11	• End of chapter/unit test	