Lesson Plans

Year 8 Science Chapter 2 Cells

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 (5 weeks)

Chapter 2 Cells

Cells are the basic units of living things and have specialised structures and functions (ACSSU149)

- ★ examine a variety of cells use a light microscope, by digital technology or by viewing a simulation
- ★ distinguish plant cells from animal or fungal cells
- ★ identify structures within cells and describe their function
- ★ recognise that some organisms consist of a single cell
- ★ recognise that cells reproduce via cell division
- ★ describe mitosis as cell division for growth and repair

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 2 Cells (5 weeks)

Lesson	Method	Resources
1	General (covering book, ruling pages, paste study guide etc.) Purpose of chapter Introduce/discuss Cells p27 Activity: Magnifying glass p28 HW: How to estimate the magnifying power of a magnifying glass p28	Magnifying glass activity p28
2	Internet: How to use a microscope Internet: How to prepare microscope slides Use a microscope p29 Use a microscope activity p29 HW: Challenge p28	Internet Microscope
3	Magnifying power p29 Exercise p29 Internet 'How to make a laser microscope' HW: Complete activity ie graphs as necessary	Demonstrate laser micro-scope
4	Discuss 'field of view' p30 'Field of view' activity p30 Converting mm and microns p30 Exercise p30 HW: Complete exercise	Microscopes Graph paper
5	Types of microscopes Field diameter calculations p31 Exercise p31 Internet 'How to make a USB webcam' HW: Complete the exercise p31 view 'microscape photos'	Demonstrate USB webcam
6	Discuss the diversity of microscopic life. Internet 'life in pond water' How to prepare pond water slides Activity: Microscope and pond water p32 HW: Use internet to identify sketches of pond water life	Internet Microscope Pond water
7	How to prepare slides of onion cells Activity: Microscope and onion cells p32 Activity: Microscope and cheek cells p32 Activity: View prepared bacteria slides p32 HW: Use internet to view plant cells vs animal cells	Microscope
8	Review 'Kingdoms' p33. Discuss cell differences Discuss: Animal cells Activity: Sketch and label animal cells p34 Activity: View and sketch prepared animal cells p34 HW: Practice sketching and labelling animal cells p34	Microscope Prepared ani-mal cells

Chapter 2 Cells (5 weeks)

Lesson	Method	Resources
9	Quick test: Sketch and label typical animal cell Internet: Animal cells and how to make an animal cell model Discuss: How to make an animal cell model Exercise p35 HW: Complete Exercise and/or make an animal cell model	Internet
10	Discuss: Plant cells Activity: Sketch and label plant cells p36 Activity: View and sketch prepared plant cells p36 HW: Practice sketching and labelling plant cells p36	Microscope Prepared plant cell
11	Quick test: Sketch and label typical plant cell Internet: Plant cells and how to make a plant cell model Discuss: How to make a plant cell model Exercise p37 HW: Complete Exercise and/or make a plant cell model	Internet
12	Discuss: Fungal cells Activity: Sketch and label fungal cells p38 Activity: View and sketch prepared fungal cells p38 HW: Practice sketching and labelling fungal cells p38	Microscope Prepared fungal cells
13	Quick test: Sketch and label typical fungal cell, animal cell and plant cell Internet: Fungal cells and how to make a fungal cell model Challenge: Create 5 fungi jokes/puns p39 Exercise p39 HW: Complete Exercise	Internet
14	Discuss: Protista cells Activity: Sketch and label protista cells p40 Activity: View and sketch prepared protista cells p40 HW: Practice sketching and labelling protista cells p40	Microscope Prepared protista cells
15	Test: Sketch and label typical protista, fungal, animal, and plant cells Internet: protista cells Activity: Find euglena p41 Exercise p41 HW: Complete Exercise	Internet
16	Discuss: Bacteria cells Activity: Sketch and label bacteria cells p42 Activity: View and sketch prepared bacteria cells p42 HW: Practice sketching and labelling bacteria cells p42	Microscope Prepared protista cells
17	Test: Sketch and label typical bacteria, protista, fungal, animal, and plant cells Internet: Bacteria cells Activity: Model of a bacteria cell p43 Exercise p43 HW: Complete Exercise	Internet
18	Discuss need for cell division and cell division Internet: Cell division Discussion of mitosis Difference between mitosis and meiosis Exercise p44 HW: Complete exercise	Internet

Chapter 2 Cells (5 weeks)

Lesson	Method	Resources
19	Discussion of the four phases of mitosis Sketching and describing the four phases of mitosis Exercise p45 HW: Complete Exercise and revise the four phases of mitosis	
20	Test the four phases of mitosis Science inquiry Group selection of an inquiry question from p51 Group conduction of an investigation to answer the question.	
21	Continuation of investigation Write report (samples on p21 and p25) HW: Complete report as required	
22	Chapter Review and Task Exercises p52 and p53 Begin work on 'A Task' p27 HW: Complete exercises & work on task as required	
23	Chapter Review and Task Exercises p54 and p56 Continue work on 'A Task' p27 HW: Complete exercises & work on task as required	
24	Chapter Review and Task Competition questions p57 Harder test questions p58 Preparation for test Continue work on 'A Task' p27 HW: Complete exercises & work on task as required	
25	End of chapter/unit test	