Lesson Plans

Year 10 Science Chapter 3

Theory of Evolution

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 page 37
End of Unit Test

Content Description (4 weeks)

Chapter 3 Theory of Evolution

The theory of evolution by natural selection explains the diversity of live things and is supported by a range of scientific evidence (ACSSU185)

- ★ Outline processes involved in natural selection including variation, isolation and selection.
- ★ Describe biodiversity as a function of evolution.
- ★ Investigate changes caused by natural selection in a particular population as a result of a specified selection pressure such as artificial selection in breeding for desired characteristics.
- ★ Relate genetic characteristics to survival and reproductive rates.
- ★ Evaluate and interpret evidence for evolution, including the fossil record, chemical and anatomical similarities, and geographical distribution of species.

Content structure

The Australian Curriculum: Science has three interrelated strands: *Science Understanding, Science as a Human Endeavour and Science Inquiry Skills*.

Together, the three strands of the science curriculum provide students with understanding, knowledge and skills through which they can develop a scientific view of the world. Students are challenged to explore science, its concepts, nature and uses through clearly described inquiry processes.

Science Understanding

Science understanding is evident when a person selects and integrates appropriate science knowledge to explain and predict phenomena, and applies that knowledge to new situations. Science knowledge refers to facts, concepts, principles, laws, theories and models that have been established by scientists over time.

The **biological sciences** sub-strand is concerned with understanding living things. The key concepts developed within this sub-strand are that: a diverse range of living things have evolved on Earth over hundreds of millions of years; living things are interdependent and interact with each other and their environment; and the form and features of living things are related to the functions that their body systems perform. Through this sub-strand, students investigate living things, including animals, plants, and micro-organisms, and their interdependence and interactions within ecosystems. They explore their life cycles, body systems, structural adaptations and behaviours, how these features aid survival, and how their characteristics are inherited from one generation to the next. Students are introduced to the cell as the basic unit of life and the processes that are central to its function.

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.

Science as a Human Endeavour

Through science, humans seek to improve their understanding and explanations of the natural world. Science involves the construction of explanations based on evidence and science knowledge can be changed as new evidence becomes available. Science influences society by posing, and responding to, social and ethical questions, and scientific research is itself influenced by the needs and priorities of society. This strand highlights the development of science as a unique way of knowing and doing, and the role of science in contemporary decision making and problem solving. It acknowledges that in making decisions about science practices and applications, ethical and social implications must be taken into account. This strand also recognises that science advances through the contributions of many different people from different cultures and that there are many rewarding science-based career paths.

Science across Foundation to Year 12

Years 7–10, typically students from 12 to 15 years of age, Curriculum focus: explaining phenomena involving science and its applications

During these years, students continue to develop their understanding of important science concepts across the major science disciplines. It is important to include contemporary contexts in which a richer understanding of science can be enhanced. Current science research and its human application motivates and engages students.

Within the outlined curriculum, students should undertake some open investigations that will help them refine their science inquiry skills. The quantitative aspects of students' inquiry skills are further developed to incorporate consideration of uncertainty in measurement. In teaching the outlined curriculum, it is important to provide time to build the more abstract science ideas that underpin understanding.

Chapter 3 Theory of Evolution (4 weeks)

Lesson	Method	Resources
1	General (covering book, ruling pages, paste study guide etc.) Purpose of chapter Introduce/discuss theory of evolution p38 Watch a couple of online videos on 'What is the theory of evolution' Watch a couple of online videos on 'Speciation' Exercise p39 HW: Complete exercise p39	Internet
2	Short test: Theory of evolution Natural selection p40 Watch a couple of online videos on 'Peppered moths' Activity p41 'Natural selection games and simulations'	Internet
3	Short test: Theory of evolution Natural selection p40 Exercise p41 Webquest 'Natural selection' HW: Complete exercise/web quest	Internet
4	Short test: Theory of evolution Darwin's finches p42 Watch a couple of online videos on 'Darwin's finches' Exercise p43 HW: Complete exercise p43	Internet
5	Short test: Theory of evolution and Darwin's finches Watch a couple of online videos on 'Galapagos giant tortoise' Activity p43 'Galapagos giant tortoise' HW: Complete activity p43	Internet
6	Short test: Theory of evolution and Darwin's finches Natural selection p44 Activity p44 'Natural selection simulation 1' and Discussion p45 HW: Complete discussion activity 1 p45	Materials for actvity 1 p44
7	Short test: Theory of evolution and Darwin's finches Natural selection p44 Activity p44 'Natural selection simulation 2' and Discussion p45 HW: Complete discussion activity 2 p45	Materials for actvity 2 p44
8	Short test: Theory of evolution, Darwin's finches, natural selection Speciation p46 and island speciation p47 Watch a couple of online videos on 'Speciation' and 'Diane Dodd's fruit fly' Exercise p47 HW: Challenge p47, complete exercise p47	Internet
9	Short test: Theory of evolution, natural selection, speciation Artificial selection p48 Watch some online videos on 'Selective breeding' Activity p49 'Pet breeding simulation' HW: Puzzles p63	Internet
10	Short test: Theory of evolution, natural selection, speciation Artificial selection p48 Exercise p49 HW: Complete exercise p49	

Chapter 3 Theory of Evolution (4 weeks)

Lesson	Method	Resources
11	□ Short test: Evolution, natural selection, speciation, selective breeding □ Evidence for evolution p50 'Common descent' □ Watch some online videos 'Common descent' □ Activity p51 'Similarity of vertebrate limbs' □ Exercise p51 □ HW: Complete exercise p51	Internet
12	□ Short test: Evolution, natural selection, speciation, selective breeding □ Evidence for evolution p52 'Fossils' □ Exercise p53 □ Challenges p52 □ HW: Complete exercise p53	Internet
13	□ Short test: Natural selection, speciation, selective breeding, evidence □ Evidence for evolution p54 'Biogeography' □ Watch some online videos 'Biogeography' □ Exercise p55 □ Complete a Word Bank p55 □ HW: Challenge p55 and Word Bank	Internet
14	□ Short test: Natural selection, speciation, selective breeding, evidence □ Genetically modified crops p56, Exercise p56 □ Mutations p57, Exercise p57 □ HW: Complete exercises p56, 57	
15	□ Short test: Natural selection, speciation, selective breeding, evidence □ Science Inquiry - undertake some of the suggested investigations p59 □ HW: Investigations p59	
16	Chapter Review and Task □ Exercises p60, p61 □ Begin work on 'A Task' p37 □ HW: Complete exercises & work on task as required	
17	Chapter Review and Task □ Exercises p62 and Competition Questions p65 □ Begin work on 'A Task' p37 □ HW: Complete exercises & work on task as required	
18	Chapter Review and Task □ Exercises p64 and Harder test questions p66 □ Continue work on 'A Task' p37 □ HW: Complete exercises & work on task as required	
19	Chapter Review and Task □ Preparation for test □ Continue work on 'A Task' p37 □ HW: Complete exercises & work on task as required	
20	□ End of chapter/unit test	