**Biological Sciences Program 2014 YEAR 9 AEP** 

**AUSTRALIAN CURRICULUM CONTENT DESCRIPTIONS**

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| **Science Understanding** |
| **Multi-cellular organisms rely on coordinated and interdependent internal** [**systems**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=systems) **to respond to changes to their** [**environment**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=environment)[**(ACSSU175)**](http://www.australiancurriculum.edu.au/Elements/ACSSU175)**Ecosystems consist of communities of interdependent organisms and abiotic components of the** [**environment**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=environment)**;** [**matter**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=matter) **and energy flow through these** [**systems**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=systems)[**(ACSSU176)**](http://www.australiancurriculum.edu.au/Elements/ACSSU176) |
| **Science as a Human Endeavour** |
| **Nature and Development of science*** Scientific understanding, including models and theories, are contestable and are refined over time through a process of review by the scientific community [(ACSHE191)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=HE&layout=1)
* Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries [(ACSHE192)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=HE&layout=1)

**Use and influence of science*** People can use scientific knowledge to evaluate whether they should accept claims, explanations or predictions [(ACSHE194)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=HE&layout=1)
* Advances in science and emerging sciences and technologies can significantly affect people’s lives, including generating new career opportunities [(ACSHE195)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=HE&layout=1)
* The values and needs of contemporary society can influence the focus of scientific research [(ACSHE230)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=HE&layout=1)
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| **Science Inquiry Skills** |
| **Questioning and predicting** ● Formulate questions or hypotheses that can be investigated scientifically [(ACSIS198)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1) ● Formulate questions that can be investigated scientifically and develop testable hypotheses based on prior observations, scientific knowledge and primary and  secondary sources [(ACSIS209)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1)**Planning and conducting*** Plan, select and use appropriate investigation methods, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods [(ACSIS199)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1)
* Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data [(ACSIS200)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1)

**Processing and analysing data and information*** Analyse patterns and trends in data, including describing relationships between variables and identifying inconsistencies [(ACSIS203)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1)
* Use knowledge of scientific concepts to draw conclusions that are consistent with evidence [(ACSIS204)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1)

**Evaluating** * Evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data [(ACSIS205)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1)
* Critically analyse the validity of information in secondary sources and evaluate the approaches used to solve problems [(ACSIS206)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1)

**Communicating*** communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations [(ACSIS208)](http://curriculumorganiser.com.au/organiser/openlink?linkurl=australiancurriculum.edu.au/Science/Curriculum/F-10?y=10&s=IS&layout=1)

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| **Vocabulary –** These terms are important in conveying your understanding in the Biological Sciences

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| Abiotic | Digestion | Homeostasis | Predator |
| Adaptation | Disease | Interdependence | Prey |
| Adolescence | Ecology | Multicellular | Population |
| Biotic | Ecosystem | Muscle | Photosynthesis |
| Biodiversity | Energy Pyramid | Mutualism | Sustainability |
| Cell | Environment | Nerve | System |
| Cellular Respiration | Excretion | Organ | Vaccine |
| Circulation | Food Chain | Organism | Tissue |
| Community | Food Web | Pathogen | Tropic |
| Decomposer | Habitat | Parasite | Unicellular |
| Mitochondria | Chloroplast | Chlorophyll | Respiration |

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**Biological Sciences Program 2014 Year 9 AEP**

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|  | **Content Description**  | **Week** | **Teaching Plan** | **References/****Resources** | **Homework & Assessment** |
| **AEP** | **Multi-cellular organisms rely on coordinated and interdependent internal** [**systems**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=systems) **to respond to changes to their** [**environment**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=environment)[**(ACSSU175)**](http://www.australiancurriculum.edu.au/Elements/ACSSU175)* describing how the requirements for life (for example oxygen, nutrients, water and removal of waste) are provided through the coordinated function of body systems such as the respiratory, circulatory, digestive, nervous and excretory systems
 | 1 | **Review of the Reactions for Life**Compare respiration and photosynthesis and their role in biological processes. Explain why carbon dioxide is fundamental to life on earth. | **Pearson Science 9**Chapter 3.3: pp 85-89Practical activity 3.3.1 Looking at stomatap 91Practical activity 3.3.2Testing leaves for starchp 92 | **Pearson Science 9****Homework Book****3.5 Light and dark reaction p31****and** **3.6 Rate of photosynthesis****p 33** |

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|  | **Content Description** | **Week** | **Teaching Plan** | **References/****Resources** | **Homework & Assessment** |
| **Requirements for life** |  |  **1\2** | **Review of the Digestive and Excretory Systems****1.** Discuss the processes that are required by all living things (Mrs Gren) and briefly compare how unicellular and  multicellular organisms achieve these different processes.**2.** Explain how living things are organised at different levels of  complexity – cells, tissues, organs and systems.**3.** Show how multicellular organisms use organ systems to  achieve life processes and emphasis the interdependence of these systems.**4.** Revise the digestive system and excretory system as examples from the previous year**5.** Examine other methods of excretion e.g. urination,  sweating, exhaling. | **Pearson Science 9**Chapter 7.3: pp 244-253**Pearson Science 8**Chapter 3.1: pp 79-88Chapter 3.5: pp 118-125**Suggested Questions** Unit Review 7.3: p251Unit Review 3.1: p85Unit Review 3.2: p123**Suggested Practical Activities:****Breaking down oil and fat**Pearson 8 p87**Kidney Dissection:**Pearson 8 p124-125 | **HW 1:Pearson Science 9****Homework Book****7.7 Kidney Function****7.8 Sweating** |

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| **Body Systems** | **Multi-cellular organisms rely on coordinated and interdependent internal** [**systems**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=systems) **to respond to changes to their** [**environment**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=environment)[**(ACSSU175)**](http://www.australiancurriculum.edu.au/Elements/ACSSU175)* describing how the requirements for life (for example oxygen, nutrients, water and removal of waste) are provided through the coordinated function of body systems such as the respiratory, circulatory, digestive, nervous and excretory systems
 | **2/3** | **The Respiratory and Circulatory Systems****6.** Revise the respiratory system from the previous year**7.** Introduce the circulatory system and show how the  respiratory system and circulatory system work together to transport oxygen and carbon dioxide around the body.**8.** Investigate other important roles of the circulatory system  e.g. the transportation of nutrients and waste products  around the body**9.** Investigate the differences in the circulatory systems of  different types of animals e.g. compare the number of  chambers in the hearts fish, amphibians, reptiles, birds and mammals. | **Pearson Science 9**Chapter 7.3: pp 244-251**Pearson Science 8**Chapter 3.2: p89-97Chapter 3.3: p98-108**Suggested Questions** Unit Review 7.3: p251Unit Review 3.2: p94Unit Review 3.3: p105**Suggested Practical Activities:****Changing air**Pearson 8 p96**Heart Dissection:**Pearson 8 p106-108 | **HW 2:** **Pearson Science 8****Homework Book****3.6 Comparing Respiration Systems****3.7Heart** |
| 3**3** | **The Nervous System****10.** Introduce the nervous system**11.** Divide the nervous system into CNS, PNS and explain the sensory and motor division**12.** Explain Sympathetic and Parasympathetic division**13.** Investigate basic nervous system functions and responses through a series of experiments: reflexes, hot-cold sensory experience and interpretation, pupil reaction etc.**14.** Investigate how the nervous system helps maintain the  body functioning (for example: body temperature), and its importance | **Pearson Science 9**Chapter 7.1: pp 225-234**Suggested Questions** Unit Review 7.1: p234**Suggested Practical Activities:****Sensitivity:** Pearson 9 p235**Reaction Times:**Pearson 9 p236 | **HW 3:** **Pearson Science 9****Homework Book****7.1 The nervous System****7.2 ReflexesScience Inquiry Skills Validation Test****Week3** |
| **4** | **The Endocrine System****15.** Introduce the endocrine system**16.** Review some of the organs involved in the endocrine system as secretors of hormones.**17.** Investigate how hormones work.  | **Pearson Science 9**Chapter 7.2: pp 237-242**Suggested Questions** Unit Review 7.2: p242**Suggested Practical Activities:****Model Feedback System**Pearson 9 p243 | **HW 4: Pearson Science 9****Homework Book****7.5 Temperature Control****7.6 Glycaemic Index** |
| **Body Systems** | **Multi-cellular organisms rely on coordinated and interdependent internal** [**systems**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=systems) **to respond to changes to their** [**environment**](http://www.australiancurriculum.edu.au/Glossary?a=S&t=environment)[**(ACSSU175)**](http://www.australiancurriculum.edu.au/Elements/ACSSU175)\*describing how the requirements for life (for example oxygen, nutrients, water and removal of waste) are provided through the coordinated function of body systems such as the respiratory, circulatory, digestive, nervous and excretory systems | **5** | **Disease and the Immune System****20.** Introduce the immune system**21.** Explain the types of cells involved in the immune response to microorganisms**22.** Discuss how and why immunisation works**23. Investigate disease and sources of infection.** | **Pearson Science 9**Chapter 8.1: pp 259-265Chapter 8.2: pp 268-274**Suggested Questions** Unit Review 8.1: p265Unit Review 8.2: p275**Suggested Practical Activities:****The Milk is Off!**Pearson 9 p267**Carried by mosquitoes**Pearson 9 p276 | **HW 5: Pearson Science 9****Homework Book****8.2 Immunisation****8.3 Pandemic****Mid Unit Test Assessment****Week 5** |

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|  | **Content Description**  | **Week** | **Teaching Plan** | **References/****Resources** | **Homework & Assessment** |
| **AEP** |  | **6** | **Extension****17.** Explain the relationship between the nervous and the  endocrine system.**18.** Discuss feedback loops.**19.** Investigate how the endocrine system regulates the  function of other organs, and how a disruption in this  response can lead to disease (for example: diabetes,  thyroid gland etc.)**Bacteria** | **Pearson Science 9**Chapter 7.1- 7.3:  pp 225-257Chapter 8.1 – 8.2:  pp 258-279Chapter 9.1 -9.3: pp 280-314**Suggested Questions** Chapter 7Reveiw: p254Chapter 8 Review: p277Chapter 9 Review: p254 | **HW 10: Pearson Science 9****Literacy Review 7.9****Literacy Review 8.8****Literacy Review 9.8** |
| **Populations** | * examining factors that affect population sizes such as seasonal changes, destruction of habitats, introduced species
 | **7** | **Populations and Communities****24.** Introduce the concepts of an ecosystem **25.** Explore the factors influencing organisms in an ecosystem. **26.** Examine population growth and decline, and factors that affect population sizes (seasonal changes, habitat  destruction, introduction of foreign species etc.)**27.** Introduce concept of Community**28.** Investigate interactions between organisms such as  predator/prey, parasites, competitors, mutualism, pollinators and disease. | **Pearson Science 9**Chapter 9.1: pp 244-253**Suggested Questions** Unit Review 9.1: p288**Suggested Practical Activities:****Termite guts**Pearson 9 p289**Temperature and activity**Pearson 9 p289 | **HW 6: Pearson Science 9****Homework Book****9.4 counting Kangaroos****9.6 Biotic and Abiotic Factors** |

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| **Energy Flow** | * considering how energy flows into and out of an ecosystem via the pathways of food webs, and how it must be replaced to maintain the sustainability of the system
 | **8** | **Energy Flow in the Ecosystem****29.** Recall the knowledge of food webs, food chains, producers, consumers and decomposers**30.** Introduce trophic levels and consider the transfer of energy  from one level to the next. Make an energy pyramid.**31.** Consider how energy flows in and out of food webs, and how  it must be replaced for the sustainability of the system**32.** Investigate ecological efficiency and biodiversity. | **Pearson Science 9**Chapter 9.2: pp 291-297**Suggested Questions** Unit Review 9.2: p297**Suggested Practical Activities:****Photosynthesis**Pearson 9 p299**Studying a leaf litter environment**Pearson 9 p299 | **HW 7: Pearson Science 9****Homework Book****9.2 Deep Sea Fish****9.3 Food Webs** |
| **Balance and Imbalance** | * considering how energy flows into and out of an ecosystem via the pathways of food webs, and how it must be replaced to maintain the sustainability of the system
* investigating how ecosystems change as a result of events such as bushfires, drought and flooding
 | **9****&****10** | **Balance in Ecosystems****33.** The importance or predators and prey to keeping balance in the ecosystem.**34.** Investigate what happens when predators or prey are  removed from an ecosystem.**35.** Examine the role of competition in maintaining balance in an  ecosystem.**36.** Examine the role of parasites.**37.** Examine the role of microorganisms in maintaining balance in terms of decomposers and disease. | **Pearson Science 9**Chapter 9.3: pp 301-210**Suggested Questions** Unit Review 9.3: p310**Suggested Practical Activities:** | **HW 8: Pearson Science 9****Homework Book****9.7 Dung Beetles** |
| **Imbalance in Ecosystems****38.** Perform cases studies of what happens to an ecosystem as a result of fire, drought and flooding**39.** How does the ecosystem recover and how long does it take?**40.** Which animals and plants are affected negatively? And which animals and plants benefit from the ‘disaster’?**41.** Identify the ways in which Humans can impact the ecosystem? | **Pearson Science 9**Chapter 9.3: pp 301-310**Suggested Questions** Unit Review 9.3: p310**Suggested Practical Activities:****Wastes**Pearson 9 p311**Detergents and plants**Pearson 9 p311 | **HW 9: Pearson Science 9****Homework Book****9.1 Smoke and germination****9.5 Recovery plans for endangered species****End Of Unit Test Assessment****Week 10** |

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| **Year 9 Achievement Standard****By the end of Year 9, students should be able to:*** A**nalyse how biological systems function and respond to external changes with references to interdependencies, energy transfers and flows of matter**.

 **Students should also be able to:*** **design questions that can be investigated using a range of inquiry skills.**
* **design methods that include the control and accurate measurement of variables and systemic collection of data and describe how they considered ethics and safety.**
* **analyse trends in data, identify relationships between variables and reveal inconsistencies in results.**
* **analyse their methods and the quality of data, and explain specific actions to improve the quality of their evidence.**
* **evaluate others’ methods and explanations from a scientific perspective and use appropriate language and representations when communicating their findings and ideas to specific audiences.**
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**Assessment Structure**

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| **Assessment Type** | **Task Description** | **Week** | **Semester Task Weighting** |
| **Test** | **Science Inquiry Skills Validation Test****(Biology)** | **3** | **Semester 1****10%** |
| **Test** | **Biology Test 1****(A&P Body Systems)** | **5** | **Semester 1****25%** |
| **Test** | **Biology Test 2****(Populations &Ecosystems)** | **10** | **Semester 2****20%** |
| **Teacher Mark** | **Homework/short tests/assignments/experiments etc** | **Ongoing** | **Semester 1****10 %** |