

Year 11 Biology - Unit Two: Organisms and their Environment

Area of Study 2- Dynamic Ecosystems

Outcome 2 On completion of this unit the student should be able to design conduct and report on a field investigation related to the interactions between living things and their environment, and explain how ecosystems change over time.

Outcome 2. Design, conduct and report on a field investigation related to the interactions between living things and their environment and explain how ecosystems change over time.

Assessment task: Report on an Ecosystem.

Key knowledge This knowledge includes;

- components of ecosystems:communities of living organisms, ecological groupings; ecological niche
- relationship between organisms: feeding including parasite/host, predator/prey, of mutual benefit including mutualism and symbiosis;
- flow of energy : inputs and outputs of the system; productivity; trophic levels and trophic efficiency
- cycling of matter; principle of exchange between living and non-living components of the ecosystem, including inputs and outputs; biogeochemical systems including those of water, carbon, oxygen; nitrogen; bioaccumulation;
- population dynamics; carrying capacity of ecosystems; factors effecting distribution and abundance of organisms including birth and death rates, migration;
- Change of ecosystems over time
 - Scope and intensity of regular and irregular natural changes; succession
 - Human activity and the sustainability of ecosystems
 - Historical practices of indigenouspeoples and settlers;
- Techniques for monitoring and maintaining ecosystems.

| | KeyKnowledge | Learning Strategies | Biozone/Text Reading and Q's | Other resources |
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| Lesson 1 | <p>Outcome 1-Environmental Factors: biotic and abiotic. Availability of Resources.</p> <p>Outcome 2 Components of ecosystems:communities of living organisms, ecological groupings; ecological niche</p> | <p>Components of an ecosystem</p> <p>Teacher Strategy PPT Dynamic Ecosystems What is an ecosystem and why study ecosystems (video on wiki)</p> <ul style="list-style-type: none"> • http://www.youtube.com/watch?v=O3CZFfyed3M&feature=player_embedded#at=12 • Student-Bookwork p23 Components of an ecosystem <ul style="list-style-type: none"> ○ define biosphere ○ atmosphere ○ biomes ○ ecological niche see p244. Do Dingo habitats p245(collecting data) • Student Activity (No Hands Up Feedback) Go through examples and identify. <ul style="list-style-type: none"> • Look at the following ecosystems and name the biotic and abiotic factors involved. • Describe the type of habitats found in each ecosystem. • Describe any human interference that may occur and how it could affect the ecosystem. • Student feedback - Exit Cards Identify one question you have or one thing you really understand. <p>Homework 231-232. Physical Factors and Gradients.</p> | <p>Chapter 13, Pages 243-245 Questions 1 -2. Page 245</p> <p>230 <i>Components of an Ecosystem.</i></p> <p>231-232. <i>Physical Factors and Gradients.</i></p> <p>244. <i>Ecological Niche.</i> 245-246. <i>Dingo Habitats.</i></p> <p>Chapter 19, Pages 363-381 Questions 1, 4. Page 369 Questions 5-7. Page 375 Question 9-12 Page 379 Questions 14-15. Page 381</p> | <p>Heinemann Chapter 19 -Living in an Ecosystem</p> <p>http://vce-unit1and2biology.wikispaces.com/ecosystems</p> |

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| <p>Lesson 2</p> | <p>Change of ecosystems over time</p> <ul style="list-style-type: none"> Human activity and the sustainability of ecosystems Historical practices of indigenous peoples and settlers; <p>Techniques for monitoring and maintaining ecosystems.</p> | <p>Examples of Ecosystem</p> <p>Video Ecosystems 2000 Also discusses human perspectives including indigenous perspectives. Looks at tourism, salinity, poaching...</p> <p>Go over 231-232. Physical Factors and Gradients. (old-241)</p> <p>Activity - Use the website Use the following website http://www.waterwatch.org.au/monitoring.html to identify factors that affect the organisms in ecosystems. Complete handout.</p> <p>Carry out some techniques</p> <ol style="list-style-type: none"> <i>Water temperature</i> <i>pH</i> <i>Dissolved Oxygen</i> Testing for Oxygen (Need oxygen probe, fluid for probe, software on computer, thermometer, cooled hot water, pond water) <ul style="list-style-type: none"> Read handout-Dissolved Oxygen Test some samples- fish pond, hot water that's been cooled, shake some hot water. Temperature of water required.) Use worksheet to work out percent saturation of water. <i>Water Turbidity</i> <ul style="list-style-type: none"> Need to calibrate with distilled water and prepared 100NTU sample first. <p>Need to calculate averages</p> <p>How can you use a cork and stop watch to measure flow rate</p> <p>Do we have a wind speed gauge and a light meter?</p> <p>What about biotic data? How can we collect this data</p> <ul style="list-style-type: none"> Samples (Use Microscopes and Ralph Miller book to help classify) Photographs Sounds Recording observations of faeces, damage to plants.... | <p>231-232. Physical Factors and Gradients.</p> <p>389. Monitoring Water Quality.</p> | <p>(DVC- Ecosystems 2000)Not sure if we still have access to this (next year organise a w/s that allows them to document human perspectives and indigenous people. Maybe compare with Australian situation</p> |
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| <p>Lesson 3 and 4</p> | <p>Change of ecosystems over time</p> <ul style="list-style-type: none"> Scope and intensity of regular and irregular natural changes; succession <p>Components of ecosystems: communities of living organisms, ecological groupings; ecological niche</p> <p>Techniques for monitoring and maintaining ecosystems.</p> <p>Human activity and the sustainability of ecosystems. Historical Practices of indigenous peoples and settlers.</p> | <p>Discuss Excursion</p> <p>Organ pipes ecosystem (What type of ecosystem is it)</p> <ul style="list-style-type: none"> Watch the Catalyst show last Thursday 19.08.2010 http://www.abc.net.au/catalyst/stories/2987878.htm Truck driver Terry Lane is a passionate naturalist in his spare time and his work has had a dramatic impact on improving the home of some very special creatures. <p>Details for our excursion (31 August 2011) Tools to bring.</p> <ul style="list-style-type: none"> Writing material Gumboots or/and waders (bring them in Tuesday will take down in bus) <p>Lunch or money (can buy at Melbourne Uni)</p> <p>Abiotic factors -Complete data logger experiments. (See previous lesson).</p> <p>Biotic Factors - Identifying organisms (Biotic factors)</p> <ul style="list-style-type: none"> PowerPoint Handout <p>Resources</p> <ul style="list-style-type: none"> Application by Museum Victoria - Field Guide to Victorian Fauna Ralph miller Freshwater Booklets <p>Excursion Report</p> <ul style="list-style-type: none"> Give out excursion handout and go through different sections of report Discuss writing Prac reports. Use data grid to research information and collect data about the environments and history of the park. Write up iintroduction to Practical Report. Collect and use traffic light to assess. | | <p><i>Information from Parks Victoria</i> http://parkweb.vic.gov.au/1park_display.cfm?park=167</p> <p><i>Friends of the Organ Pipes</i> http://home.vicnet.net.au/~foopnp/</p> <p>'The Organ Pipes National Park - a guide for teachers and visitors' The Department of Conservation & Environment (1992) ISBN 0 7306 2635 0 organ pipes info Biol unit 2 Prac sac (2).docx</p> <p>Organ Pipes national park Management Plan 1998 (PDF Document on wiki)</p> <p>http://vce-unit1and2biology.wikispaces.com/SAC2_OrganPipesEcosystem</p> |
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Outcome 2. Design, conduct and report on a field investigation related to the interactions between living things and their environment and explain how ecosystems change over time.

Report on an Ecosystem. (To be submitted by end of term)

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| | Relationship between organisms: feeding including parasite/host, predator/prey, of mutual benefit including mutualism and symbiosis; | <p>Feeding relationships PPT</p> <ul style="list-style-type: none"> Species interaction pp305 Symbiosis – parasites/host; mutualism, commensalism <ul style="list-style-type: none"> Guine worm/human parasite Ant and caterpillar Relationship Predator-Prey relationships <ul style="list-style-type: none"> Predator-Prey Interactions (p310) Predator-Prey Strategies(p 311) | <p>Biozone</p> <p><i>PP305-306 Species Interaction</i></p> <p><i>PP 310 Predator-Prey Interactions</i></p> <p><i>PPP311 Predator-Prey Strategies</i></p> | <p>Heinemann</p> <p>Chapter 20, Pages 384-401</p> <p>Questions 1-14</p> <p>Guinea Worm Video</p> <p>http://www.youtube.com/watch?v=8FYgQFSrZDE&feature=player_embedded</p> <p>Ant / caterpillar Mutualism</p> <p>http://www.youtube.com/watch?v=z3bWqIP_LpMg&feature=player_embedded</p> |
| | flow of energy : inputs and outputs of the system; productivity; trophic levels and trophic efficiency | <p>Lesson 1 Energy Flow</p> <ul style="list-style-type: none"> Food chains <ul style="list-style-type: none"> W/S Classical Communities-Life in an Ecosystem PPTNotes What is a food chain http://vce-unit1and2biology.wikispaces.com/EnergyFlow Example choose one from wiki http://www.ecokids.ca/pub/eco_info/topics/frogs/chain_reaction/play_chainreaction.cfm Define orders http://www.gould.edu.au/foodwebs/kids_web.htm Complete on W/s above-List all possible food chains and define order Food Webs <ul style="list-style-type: none"> PPT Notes Complete W/s/ Rearrange chains into food web | <p>Biozone</p> <p><i>P292 Food Chains</i></p> <p><i>PP 293-294 Constructing a Food Web</i></p> <p><i>PPP295-296 Dingo food Web</i></p> <p><i>P297 Cave food Webs</i></p> | <p>Heinemann</p> <p>Chapter 20, Pages 384-401</p> <p>Questions 1-14</p> |
| | Flow of energy : inputs and | Lesson 2 Energy Flow | BIOZONE | Heinemann |

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| | <p>outputs of the system;</p> <p>Trophic levels and trophic efficiency</p> <p>Bioaccumulation; Human activity and the sustainability of ecosystems.</p> | <ul style="list-style-type: none"> • H/O Definitions – A web of Interaction (Do this while i am setting up) • Take a look at page 291 Inputs and Outputs-Discuss Energy Flow <ul style="list-style-type: none"> ○ PPT_What is energy and how it is identified ○ Do pp299-300 Ecological Pyramids <ul style="list-style-type: none"> ○ Numbers, Biomass and Energy pyramids ○ Do pp303-304 Biomagnification/Bioaccumulation (PPT) <ul style="list-style-type: none"> ○ Define (PPT) ○ Susan Shaw (TED) http://blog.ted.com/2010/07/27/the_oil_spills_1/ ○ Examples Mercury, DDT | <p><i>P 291 Energy inputs and Outputs</i> <i>PP 299-300 Energy Flow in an Ecosystem</i></p> <p>BIOZONE <i>PP303-304 Ecological Pyramids</i></p> <p>BIOZONE <i>P298 Pesticides and Biomagnification</i></p> | <p>Chapter 20, Pages 384-401 Questions 1-14</p> |
| | <p>Factors that effect energy flow</p> | <p>Factors that effect ecosystems(PPT)</p> <p>Biological Reasons for changes in ecosystem</p> <ul style="list-style-type: none"> • Predation • Disease • Natural Disaster • Competition <p>Human Interference</p> <p>Competition</p> <ul style="list-style-type: none"> • Interspecific • Intraspecific • Predator Prey Interactions | <p>PP 308 Interspecific Competition PP 309 Intraspecific Competition P 310 Predator-Prey Interactions P311 Predator-Prey Strategies</p> <p>PP. 365-366. Ecosystem Stability.</p> | <p>Heinemann</p> <p>Chapter 20, Pages 384-401 Questions 1-14</p> |
| | <p>Cycling of matter; principle of exchange between living and non-living components of the ecosystem, including inputs and outputs; biogeochemical systems including those of water, carbon, oxygen; nitrogen;</p> | <p>Matter is recycled in different ways through the following processes</p> <ul style="list-style-type: none"> • Water Cycle • Carbon cycle • Nitrogen cycle • Phosphorus Cycle | <p>PP284 Nutrient Cycles 319. The Water Cycle.(only in old biozone) PP285-286 The Carbon Cycle. PP287-288 The Nitrogen Cycle.</p> | <p>See wiki for videos http://vce-unit1and2biology.wikispaces.com/Cycling_ofMatter Chapter 21 Pages 414-423 Q9-16</p> |