Year 9 Science – Ecosystems (6 week, 18 lesson unit)

Student strengths

- One students who is new to the school has already completed a unit on ecosystems.

Student weaknesses

- Two students have reading and writing difficulties and one student has a mild form of autism and does not like group work.

Relevant context

- In terms of prior learning, students will already have had some learning about the natural environment upon which this unit is an extension.
- It is assumed for this unit that there will be a speaker available from the local landcare organisation or something similar that is able to give a speech to the class about ecosystems and the importance of their protection.
- The students in this particular classroom will already have experience in working with power point presentations and will be able to effectively use a computer and search the Internet.

Essential learnings

- Science as a human endeavour – immediate and long term consequences of human activity can be predicted by considering past and present events.
- Life and living – The diversity of plants and animals can be explained using the theory of evolution through natural selection
  - In ecosystems, organisms interact with each other and their surroundings
  - Changes in ecosystems have causes and consequences that may be predicted
- Ways of working – identify problems and issues, formulate scientific questions and design investigations
  - Plan investigations guided by scientific concepts and design and carry out fair tests
  - Research and analyse data, information and evidence
  - Select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations
  - Communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology in appropriate formats (Queensland Studies Authority, 2007)

Resources

- Teacher resources - Power point presentations, dvd documentaries, student text book, audio recordings of different ecosystem sounds, microscopes and other laboratory equipment, camera, whiteboard and whiteboard marker, visit from local Landcare coordinator.
- Student resources – blank poster paper, exercise books, writing implements.

Planning Frames

- The productive pedagogies framework has been utilised in the construction of this unit overview. This framework supports the idea that it is important to consider and support the different learning styles of students within a classroom. This has been attempted in the design of this unit overview.
- The ideas put forward in the four resources model have also been considered. By using multiliteracies throughout this unit it is hope that the students will be also to understand, use, participate and analyse the different texts used in order to gain a deep understanding of ecosystems.

- As stated above, multiple types of literacy learning have been incorporated into the unit to encourage deep learning of the topic of ecosystems in all students.

Assessment

- In class formative assessment compiled during class discussions and activities.
- Summative assessment will be obtained through the completion of two prac reports and an end of unit assignment. The assignment will be in the form of an essay researching the possible effects of global warming on an ecosystem of the students' choice. For those students with writing difficulties, they will have the option of doing an oral presentation instead.

Sequence of Activities

- Introductory phase – introduce key terms and definitions. Students will be required to take notes. Students with writing difficulties will be allowed to use laptop computers or will be given a handout of the notes with pictures and diagrams.
- Power point presentations demonstrating the range of ecosystem types, including both fauna and flora aspects. Heavy emphasis on pictures, diagrams and graphs to compliment written notes. Students will engage in a discussion of the types of ecosystems surrounding the school and their homes.
- Using a David Attenborough documentary on the extremes of desert life, introduce Australia's ability to cope with and adapt to weather extremes such as drought, fire and flood.
- Practical experiment in the laboratory on water collection through transpiration. Put a clear emphasis on instructions so all students are aware of the requirements. Add and extension to the prac for the new student who has already studied ecosystems.
- Practical report on the method, results and discussion of the previous experiment. Include pictures, graphs and diagrams.
- Create a poster on bushfire safety that incorporates evacuation procedures and how to fire proof your home. Finished posters will be displayed on the classroom walls.
- Introduction of new terms including abiotic and biotic elements and terrestrial and aquatic environments. Terms will be displayed using power point projections. Students will be given a handout of the notes with diagrams to help illustrate the terms.
- Practical experiment in the laboratory on investigations into the effects of abiotic factors on plant growth.
- Practical report on the method, results and discussion of the practical investigation. This time however, report will be in the form of a paired presentation to the class. The student with autism will be given the opportunity to work autonomously.
- Documentary on plant and animal adaptations to their changing environments.
- Construct in pairs or individually a food web for a designated ecosystem and identify how changes to the environment may lead to adaptations and alterations within the food web. Computers may be used to help in the research of this activity.
- View using a microscope, examples of micro-organisms that exist within certain ecosystems.
- Research using computers and create a five minute oral presentation to the class on the relationships between certain organisms. Students will be allocated organisms to research and present on.
- Research and commence preparations for their assignments.

Queensland Studies Authority. (2007). *Science essential learnings by the end of year 9*. Retrieved March 15, 2010, from http://www.qsa.qld.edu.au/downloads/early_middle/qcar_el_science_yr9.pdf