Anakie Primary School

Biodiversity unit

A Year 5-6 student program

Biodiversity unit **program developed by**
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Case study
May 2007

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Introduction

The intention of this case study is to document an example of a curriculum unit based around sustainability which also has links to the school's targets related to increasing biodiversity. It describes potential activities, identifies challenges and opportunities and reflects on the project to-date.

It also provides a means to collate existing ideas and resources into one easily accessed document.

Overview

In 2006, Anakie Primary School was supported by Centre for Education Research and Environmental Strategies (CERES) to develop a whole school approach to sustainability.

This whole school approach was presented to curriculum development, with sustainability as a foundation. The approach is enquiry based, multi-sensory and VELS specific with targeted actions.

Workshops provided a complete process and useful tools to help guide the school to develop a whole school curriculum with a focus on actions and behaviour change.

Central to the sustainability focus is the fundamental aim for students to connect with the natural environment through regular meaningful experiences in the outdoors doing a variety of tasks and learning activities across all subject areas. Usually the local environment provides the most meaningful and assessable setting.

The school planned to commence their sustainability focussed curriculum through the development of biodiversity lessons. The attempt was made to build students' connection to their local environment and encourage them to see the need to help care for natural environments. Later units would be themed around, waste, water and energy.

In 2007, teachers implemented their biodiversity lessons. The Years 5-6 teacher, Christina Worrall, developed a biodiversity unit. This unit is described in detail through this case study.

Biodiversity unit

Context

The local environment encompasses Brisbane Ranges National Park, Mt Anakie and the Anakie Gorge.

The area is not only home to diverse plant life and wildlife including many different species of birds and some mammals, it is of geological significance.

Mount Anakie is a prominent eruption point and one of the few scoria volcanoes on the Werribee Plains. From the summit of Mount Anakie the 360 ° view includes the You Yangs and the Werribee Plains.

Stony Creek flows through Anakie Gorge which provides spectacular views of sedimentary rock structures.

A serious threat to native plant life is the *Phytophthora cinnamomi* commonly known as Cinnamon fungus, which invades and rots the roots of native plants. It can be spread by humans driving and walking through the area.

The region supports industries such as agriculture and quarrying as well as recreation pursuits such as camping, bushwalking, motorcycle riding and horse riding.

The local community offers a range of opportunities to access expertise to assist in implementing the biodiversity unit and maximising the potential for student learning.

Aims

The unit has the following aims in relation to students:

- to respect, and connect with, their local environment
- describe ways in which humans impact on, and can coexist with, the natural environment
- describe reasons why it is important to have national parks and why their use is regulated
- recognise that they have choices and that these choices impact on someone else or something
- develop their understanding of biodiversity and ecosystems.

It is envisaged that the unit of work will instil a way of living and behaving that is consistent with caring for the environment and reducing their impact on environment and in turn the local biodiversity.

Victorian Essential Learning Standards

A multi-domain approach to curriculum planning was used, to develop the *biodiversity unit*.

The *biodiversity unit* incorporates the following strands and domains:

Physical, Personal and Social Learning

- Personal Learning
- Civics and Citizenship

Discipline-based learning

- English
- Science
- Mathematics
- The Humanities/Geography
- The Arts

Interdisciplinary Learning

- Communication
- Thinking Processes
- Information and Communications Technology (ICT)

Funding

The *sustainability* program developed at Anakie was partly funded through the Australian School Innovation in Science, Technology and Mathematics ASISTM project http://www.asistm.edu.au/

ASISTM funding was used for professional learning workshops, purchase of resources and equipment and assistance to run student activities.

Anakie Primary School is one of six schools participating as You Yangs Community Cluster in the ASISTM project coordinated by Meg Parker, the You Yangs Cluster Educator. Meg has provided valuable support and guidance to the teachers involved in this ASISTM cluster project.

Biodiversity unit planner

The following planner is a guide to the activities and tasks associated with the *Biodiversity unit*. The planner is a guide only and it is expected that learning experiences will be modified as a result of student needs and interests, time constraints and other resourcing issues that may arise.

Prior to planning the unit the teacher felt it was important to clarify her own thinking related to biodiversity by reading relevant resources and discussing the topic with others that have expertise in the area.

Tuning-in	**Local community:** Students investigate their local community, their connection to it and their sense of place. Brainstorm: Generate a class list of words that describes what you might find in and around Anakie. In small groups students are given a selection of the words from the list to sort and categorise using their own headings. Students choose one aspect of the community and describe it in terms of the goods or services it provides. Individually each student identifies and describes their special place in the local community.
Setting the scene	*Prior to the visit, discuss themes the ranger may raise to help students make connections to what they already know and to better engage with the ranger* **Excursion to Mt Anakie:** Students connect with their local environment through their visit to Mt Anakie. The local Parks Victoria ranger, provides expertise on the walk about geology of the area, o Mt. Anakie is approximately 80 000 years old. The discussion could centre round what the landscape would have looked like 80 000 years ago as Mt. Anakie erupts. Talk about the coastline of that time being up to 50km further out to sea than it is at present (grip of the last ice age). Port Phillip Bay was not present and was more like a river (Yarra) than the bay. o how the area is used now, how the area has changed and how it may change in the future. o students observe and sketch what they see from the top of Mt Anakie (usually no public access). The Ranger describes what the region looked like as described by explorer Matthew Flinders … vast grasslands… Where are those grasslands now? Explanation is required to ensure students realise difference between native grassland and pasture. Native grasslands are the most threatened ecosystem in Australia. **Follow up** o debrief what we learned as a result of the excursion and record students' ideas. o students use their sketch drawn from the top of Mount Anakie as a basis and draw what the region may look like in 50 years. o Show students topographical maps of the area. Students interpret the contours to produce a model landscape using a material that can be easily moulded such as plasticine. o Invite a parent who uses maps in their chosen sport of rogaining. Students develop their understandings on how contours on maps indicate steep/flat

Biodiversity unit

Finding out and investigating	**Understanding biodiversity:** Provide students with experiences to develop and refine their understanding of biodiversity Break down the word biodiversity into root words bio (meaning life) and diversity (number and variety of species). Students study other words containing the root bio. Review literature about biodiversity and reduce technical language to make it more student friendly and accessible to all students. **Animal biodiversity:** Students read the brochure *Indigenous Fauna of the Moorabool Catchment area*, Department of Primary Industries. o They select an animal of interest and develop a 3-5 minute presentation covering six umbrella headings including appearance, food, habitat, reproduction, predators, threats [students create the presentation at home and bring to school on USB memory stick] o They are assessed by three peers and the teacher on clarity of voice, grammar, posture, appropriateness of material, level of interest. Scaffold the process by providing students with examples of what to work on when presenting ie If asked a question you are unsure of its okay to say you don't know. Create a display of the word biodiversity with each student contributing a letter of the word, depicting what biodiversity means to them.
Finding out and investigating	**Excursion to Anakie Gorge:** The excursion to Anakie gorge offers the opportunity to explore different habitats including wetlands, native grasslands and woodland. The Parks Victoria ranger provides expertise to support student learning. Students appreciate the need for National Parks to save areas of different habitats. Topics covered include: • **Protecting Victoria's plants and animals:** Introduce the concept of land clearing for agriculture and the importance of protecting the remnant bushland through the creation of the National Parks system. Discuss the importance of large scale biodiversity ecosystems such as Brisbane Ranges. Place in context to other parks and reserves. • **Introducing localised Biodiversity (ecosystems)** Identify small scale biodiversity ecosystems (streamside, grassland, open forest and heathland) and identify what animals might exist in each. Select individual plants and animals and describe why they choose or adapted to live in this particular environment. We can call each of these systems small towns or major cities. Students take a clipboard to draw sketches of the various habitats. A class set of binoculars enable students to view birds and mammals more closely. A pocket bird identification book is also part of the kit. Students use a hoop to observe an area of an ecosystem. Visit an area recently ravaged by bushfire. Students select a tree as their own and draw it carefully. The area will be revisited later in the year. Students observe and sketch their tree they note any changes between their drawings. Discuss how some plants regenerate after fire. Optional: Students complete a Y chart before they visit an ecosystem focussing on (What sounds they expect to hear, What they expect to see and what they expect to feel).
Going further	**Biodiversity plants:** o Back at school activity with a visit from the Parks Victoria ranger. Introduce the idea/metaphor that ecosystems are mini towns. Create an ecosystem (mini town) of your own and place your plants and

	animals in your town. Describe why your plants and animals live here. Can your animal live in two or more ecosystems? Are there any ecosystems your animal can't live in? Students read the brochure *Indigenous Plants of the Moorabool Catchment area*, Department of Primary Industry and complete a mini project on the topic which may include introduced weeds. Optional: Investigate plant species in the school grounds. Use references to identify the different species. o Students list the different types of plant species to generate the 10 most common plants in their backyards. Discuss those that are native, indigenous or exotic.
Drawing conclusions	**Excursion to boar gully:** Topic: Man's impact on Biodiversity. Explore the impact of man's agricultural activities on important ecosystems. Look at how local ecosystems struggle to cope with the impact of grazing and other agricultural activities.
	Excursion to Steiglitz Historic Park Topic: Natural Resistance Explore how the environment can eventually reach a balance and begin to reclaim land disturbed following major impacts from activities such as gold mining. Visit patches of bush previously occupied by houses and other dwellings.
Social action	**Conservation project:** School visit from Parks Victoria ranger. How do we increase biodiversity in our school grounds? Students are involved in nest box building to attract native birdlife and other project students show an interest in. Topic: How does this impact on you – where to from here? Introduction of local examples of Anakie specific biodiversity: Brush tailed phascogale, Peregrine falcon, Brown Tree Creepers… How can you reduce your impact on these species? Proactive activities or programs to assist specific animals or plants or environmental programs; nesting boxes or tree planting. * Commitment from school to undertake a task or project as part of its annual program.
Reflection and evaluation	Concept maps to show what students know about biodiversity. Complete a reflection: What did they learn? What did they enjoy? What was unexpected? How will you use this new information? Celebration: Conduct an event inviting the school community to share in the occasion.

Parks Victoria Ranger talks geology


View from Mt Anakie

Links to PoLT

The *Energise me* program has direct links the Department's Principles of Learning and Teaching (PoLT).

1. The learning environment is supportive and productive.
2. The learning environment promotes independence, interdependence and self-motivation.
3. Students' needs, backgrounds, perspectives and interests are reflected in the learning program.
4. Students are challenged and supported to develop deep levels of thinking and application.
5. Assessment practices are an integral part of learning and teaching.
6. Learning connects strongly with communities and practice beyond the classroom.

Program successes

Relationship building (links to PoLT Principles 1, 2)

An integral part of the *biodiversity unit* was the development of student-student relationship building, teacher-student relationship building, expert-teacher-student-parent relationships.

Chris has been instrumental in developing these relationships. Chris maintains that it is important to know your community and know your students.

Chris provides a supportive environment through a number of approaches that included:

- knowing and valuing her students
- guiding and supporting students when presenting to the class in the role of audience, presenter and assessor
- developing student respect for other points of view
- praising and celebrating student achievement
- encouraging students to show responsibility while on excursions.

Beyond the classroom (links to PoLT Principle 6)

An integral part of the *biodiversity unit* was to involve students in experiences beyond the classroom. This was achieved through:

- excursions to local environment supported by experts
- visits by experts and parents to share their expertise
- connect their learning with their home environment
- promoting their learning beyond their classroom to other school students, the principal, staff, parents and the broader community through school newsletter.

Resources

To assist students to fully engage in the program the following resources and equipment was purchased:

- Individual clipboards for students – field sketching
- Class set of grey lead pencils for sketching
- Field guide of Australian birds (by Simpson and Day)
- Field binoculars (for bird watching etc)
- Gould League mini series of books … urban birdlife, wetlands birdlife etc…

Reflection

Student presentation on Indigenous Fauna of the Moorabool Catchment area

This proved to be a very worthwhile activity which enabled students to make valuable connections between what they learned about their animal and apply understandings to pose questions that demonstrated higher order thinking.

When delivering their presentations about the chosen animal, students listened carefully and often compared the information being delivered with that of their own animal of study. They asked informed questions such as:

- How long does the young stay with the adult?
- Is it indigenous or native?
- What are its nesting habits?
- Do the young have a specific name like joey/kangaroo?

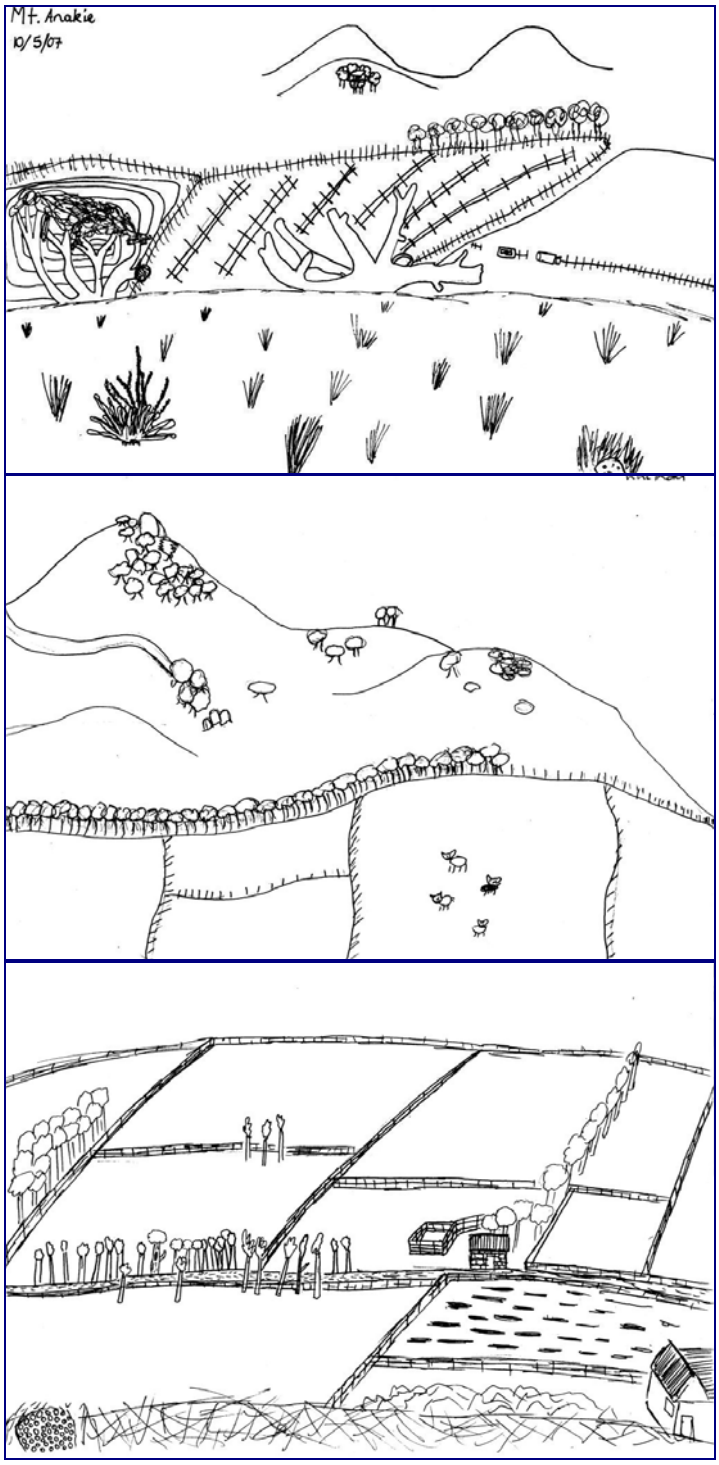
Some students made connections to previous units of work, for example a student asked whether the eagle's egg shells where threatened by pesticides making links to a topic on birds of prey.

Students discussed what are threats? They agreed that human impacts such as clearing the land, threatened ecosystems however some students argued that bushfires were a part of the natural process.

It was obvious to students that humans featured highly on the list of threats to many animals. Students came to that conclusion as a result of hearing the range of presentations that 'humans have an enormous impact on ecosystems'.

Mt Anakie excursion

When observing from the top of Mount Anakie students observed the view in detail. Each student focussed on what was meaningful to them. The sketches were quite different and highlighted different views and perspectives.
In contrast digital photographs did not quite capture the essence of what students focussed on.



Examples of students sketches from Mount Anakie

A highlight of excursions was the Parks Victoria rangers weaving storytelling in their discussions with students to assist them to build a picture of what the region would have looked like in the past.

Many students related positively to this type of learning which seemed to suit the way in which they liked to learn.

Students wrote a recount of their visit to Mt Anakie. Refer to Appendix: *Integrated Studies: Biodiversity (p. 16)*

In debriefing after the excursion students described what they learned. The following points were recorded:

- Chris please supply points to add in dot points

Challenges

Providing a meaningful program

To provide a meaningful program Chris spent considerable time clarifying her understanding of biodiversity and what would appeal to her students.

With the help of experts and consulting various references Chris was able to plan and develop a targeted program which accessed the local environment rather than for example taking students to the zoo.

Students were able to see animals and plants in situ and begin to understand the complex factors that impact on the many different types of ecosystems.

While zoos are undoubtedly a useful resource linking students to their local environment has potential to have lasting effects on behaviour and their understanding about the need to increase biodiversity in the local area.

Opportunities

Use of experts

In the main experts used in this unit were rangers from Parks Victoria. They assisted by helping plan excursions, provide background information and suggest possible activities for follow up.

Use of parents

Parents are involved in the excursion to visit the local environments. Students on the excursions are driven by parents in cars with comprehensive insurance rather than a bus. Parents have shown keen interest in their local environment and enthusiastically offer their assistance to be involved in the excursions.

Starting point for the next year

Involve Years 5-6 students in the biodiversity audit. Have them write up plans to increase biodiversity and monitor their progress against targets.

Encourage students to see their efforts as an ongoing process where their initial findings and work in the area can be built on by students in the following years. Data collection will take on a new significance and value as changes in trends may take some time to occur.

Students that take responsibility for action based projects such as habitat creation and conservation activities such as tree planting, do so when they see the relevance of increasing local biodiversity. A useful way to establish this is engaging student in programs such as this biodiversity unit.

Conclusion

Although only part way through implementing the unit, the class teacher Chris cited many occasions where students had demonstrated deep thinking about the topic and were applying understandings.

Students are enthusiastic and have engaged in the topic enjoying their visits outside the school and connecting with their local environment.

Chris has been able to incorporate the expertise of the local rangers and develop an important partnership working well together to offer students a terrific program.

The parent community has also been enthused in the program offering to drive students on excursion instead of organising a bus. Parents were keen to be involved to help out and also learn more about the region in which they live– a great demonstration of community learning.

The careful, thoughtful planning should ensure that the remaining program is implemented with a high level of enthusiasm and learning for all involved.

Appendix: Integrated Studies Biodiversity

Last Thursday, May 10th, grade 5/6 students spent an hour and a half at the top of Mt. Anakie with guide Ranger Chris from Parks Victoria. *The following is a recount of the information shared and our experiences.*

Mt Anakie was an extrusion; it was formed above the ground by lava flow from an ancient volcano. The You Yangs was an intrusion which means it was formed underground. The crystals in the rocks at the You Yangs are bigger than those in the rocks at Mt Anakie because the lava cooled slowly and this formed the crystals. The crystals expanded like a cake does in the oven.

When Mathew Flinders, an early Australian explorer, hiked to the top of the You Yangs he saw lots of open grasslands. There are not many of these types of grasslands around today. This could be because of the clearing needed for the introduction of farms, cattle, sheep, fences, roads, houses, towns, shops …etc.

It was cold on the top of Mt Anakie. It was high and we could see the whole of Anakie. The view was great! The wedge tailed eagles glided very close to us. We went into the Fire Tower Lookout and it was interesting how they found out where the fires were in the Anakie district.

Thank you to the parents who helped transport students and also to our You Yangs Learning Cluster co-ordinator who joined us on this event and helped transport students as well. Our next venture out will be in fortnight when we head to Anakie Gorge and Stoney Creek to look at a variety of ecosystems.

We got a different perspective of Anakie from a higher level. We sat on top of the mount drawing the view. Ranger Chris talked to us about the past, present and future of the Anakie district. He also talked about the geology of the area.