☆ WONDAI STATE SCHOOL

Sustainable Science Semester 1 Overview

Year Level	9 and 10
Duration	20 weeks (2 x 70 minute lessons per week)
Timing	Semester 1 2008
Unit Description	Sustainable Science will be a hands on investigation into the issues surrounding sustainable development, with a particular focus on our local community. A key initiative will be the design and development of a community permaculture garden in partnership with the Burnett Inland Economic Development Organisation. Sustainable Science will be based on the Action Research Model and students will develop and carry out action research plans based on local issues. Topics covered will include- • Permaculture • Agriculture and land management • Sustainable production – meat and livestock, dairy, horticulture, field crops, forestry • Biofuels
Outcomes	Technology Essential Learnings • People can influence decisions made about the design, development and use of technology to change the impact on people, their communities and environments at local and global levels *e.g. the design and development of energy-efficient light globes to help reduce greenhouse gases and* *global warming; recognising the impact that technology (mass production, high-speed sewing), culture* *(Indigenous perspectives, popular culture) and history (tradition, fashion trends) have had on fashion* *design.* • Characteristics of resources are compared, contrasted and selected to meet detailed specifications and predetermined standards of production to best suit the user *e.g. materials can be compared to determine those most appropriate to the task, such as selecting from a* *variety of timbers taking account of size, strength, finish and durability; choosing from natural resources* *to produce a product.* ***Earth Charter principle 1 – Care for people, plants and animals.*** ***Earth Charter principle 2 – Care for the environment.***
Learning Experiences	Students will: • Learn the basic principles of permaculture ethics and design • Learn about the use and care for animals in sustainable systems eg. Chooks • Make regular weather observations • Take soil samples and mulch gardens • Make compost and use as fertiliser

	• Design a permaculture garden • Recycle materials to be incorporated into garden • Choose season appropriate plants for the garden • Propagate seeds and care for seedlings • Build structures using appropriate materials eg. Plant propagating area, chook dome • Devise a watering system for garden • Research sustainability issues in local industries
Assessment Items	• Permaculture garden design task
Literacy Focus	☺ Discussing issues with other team members. ☺ Researching and summarising information from written text. ☺ Tabulating information. ☺ Listing information as dot points.
Technology focus	☺ Using search engines to locate information. ☺ Using design principles to create permaculture garden design
Enterprise Focus	☺ Working as part of a team. ☺ Solving problems as a team.

Wondai State School P-10 unit template

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Unit Title: Sustainable Science

Year Level: 7/9/10	KLA(s):Science	Duration: Term 3 (10 weeks)

Identify Curriculum

Ways of Working (WW)	Knowledge & Understanding (KU)
• identify problems and issues, formulate scientific questions and design investigations • • plan investigations guided by scientific concepts and design and carry out fair tests • conduct and apply safety audits and identify and manage risks	• *Science as a Human Endeavour* • Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding (year 9/10) • Scientific knowledge can help to make natural, social and built environments sustainable, at a scale ranging from local to global (year 7) • *Life and Living* • In ecosystems, organisms interact with each other and their surroundings (year 9/10) • Different feeding relationships exist within an ecosystem (year 7)
Context for Learning	**School Priorities**

Wondai State School is the pilot garden for the BIEDO (Burnett Inland Economic Development Organisation) Permaculture project. The Permaculture Project is the first step toward a green and sustainable region. The aim of this project is to encourage small communities across the region to build Permaculture gardens as a first step toward a sustainable lifestyle. The project will address waste management, water management, renewable energy systems, recycling and low impact building techniques. This is a way for communities to address global warming and other environmental pressures at a local level. Positioning gardens at local schools allows for a larger community involvement and involves our future generations in sustainability practices. The Sustainable Science classes are the focus group for the garden development.	*Improved literacy* – reading of sowing calendars and guides, seed catalogues *Improved numeracy* –keeping weather records, graphing weather over time. *Increased engagement* – use of topical issue with real life implications for students and their families and the wider community. Emphasis on hands on activities.

Develop Assessments			**Make Judgements**	
Type of Assessment	What will be Assessed	When?	Purpose of assessment	Assessable elements
Diagnostic	Skills Checklist- Design skills Construction skills Teamwork skills Refection skills	Week 8 – Friday 12/9	To ascertain the development of a variety of skills needed in the development of a permaculture garden.	• investigating • communicating • reflecting.
Summative	Practical Report –	Week 9 – Friday 12/9		WW

	Strength of Mud Bricks			investigating communicating reflecting. • identify problems and issues, formulate scientific questions and design investigations • • plan investigations guided by scientific concepts and design and carry out fair tests • conduct and apply safety audits and identify and manage risks
Sequence of Learning				
Learning Experiences & Teaching Strategies			Adjustments for needs of learners	Resources

Week 1 14/7	Form work teams based on student interest areas and level of fitness. Discuss roles of teams and jobs to be completed. Orientation visit to garden. Watering, planting and mulching activities. Care of chooks.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed. Dynamic Agriculture BLM worksheets.
Week 2 21/7	Watering, planting and mulching activities. Care of chooks. Tree planting in native/bush tucker area. Replacing of hay in chook night pen.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed.
Week 3 28/7	Watering, planting and mulching activities. Care of chooks. Herb group building "wallaby" fence around herb spiral. Tree planting in native/bush tucker section. Planting of dragonfruit. Sowing of spring vegetable seeds. Mulching around vegetable tanks. Chook activities with prep students.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed.

Week 4 4/8	Watering, planting and mulching activities. Care of chooks. Visit by Brian Jarvis, Grace Gibson (BIEDO), Kay Lyons (CTC) Mulching around vegetable tanks. Chook activities with prep students.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed.
Week 5 11/8	School Camp		
Week 6 18/8	Watering, planting and mulching activities. Care of chooks. Cob Oven Workshop with Brian Jarvis Mud brick building pilot activity.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed.
Week 7 25/8	Watering, planting and mulching activities. Care of chooks. Mud brick building.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed.

Week 8 1/9	Watering, planting and mulching activities. Care of chooks. Mud brick building.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed.
Week 9 8/9	Watering, planting and mulching activities. Care of chooks. Mud brick building.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed.
Week 10 15/9	Watering, planting and mulching activities. Care of chooks. Mud brick building.	Team format allows students to work at their own pace. Explicit instructions given to students regarding work to be completed in time allocated.	Students are able to select materials and tools they require from shed.

Name:

Sustainable Science 2008
Permaculture Garden Design Task

Task 1: You have been given the task of designing the new permaculture garden to be built at Wondai State School in partnership with the Burnett Inland Economic Development Organisation (BIEDO).

- Your design must incorporate the permaculture design principles you have been learning about and fill the allocated area
- Draw your design in pencil and use a ruler for all straight lines
- Try to keep curves smooth with a continuous line
- Your drawing should fill most of an A4 page
- You may colour your drawing if you wish
- You could use a key to label different sections of the garden

- Your garden may include

    - A fruit orchard
    - Vegetable gardens
    - Herb gardens
    - A bush tucker section
    - Mud brick structure/building
    - Pathways suitable for wheelchair access
    - Chook house
    - Plant propagation section/greenhouse
    - Weather station
    - Cobb oven/kitchen area
    - Seating and shade
    - Watering system

Task 2 :You then need to choose a number of these sections (see criteria sheet) and write a statement (50 – 100 words) explaining why you included that area and why you placed it where you did.

Task 3: You then need to design a sign for the garden which incorporates:

- The names “Earthwise Energies Community Permaculture Garden” and Wondai State School P-10 and BIEDO
- States the three attitudinal principles of permaculture
- Has graphics which help explain what the project is about

Due date: Friday 28/03/08

"Sustainable Science Permaculture Garden Design Task Criteria Sheet"

Rating	A	B	C	D	E
Descriptors	Explicit description of the standard of very high performance –not words like effective, creative, accurate, comprehensive etc. unless there is an elaboration: *"effective or accurate because it indicated knowledge of these things…"*	Explicit description of the standard of high performance	Explicit description of the standard of sound performance	Explicit description of the standard of limited achievement Positive and encouraging language What was done/used correctly?	Explicit description of the standard of very limited achievement Positive and encouraging language What was done/used correctly?
Curriculum Knowledge	A comprehensive, detailed and accurate knowledge of the principles of permaculture has been demonstrated by: ▪ Concise and accurate sign showing the three main attitudinal principles of permaculture with highly relevant graphics ▪ Clear, concise and detailed diagram of the permaculture garden design with all required sections labeled correctly ▪ Clear and detailed statements about at least five of the sections of garden including justification for their inclusion and positioning	A detailed and accurate knowledge of permaculture principles has been demonstrated by: ▪ Accurate sign showing the three main attitudinal principles of permaculture with relevant graphics ▪ Clear, detailed diagram of the permaculture garden design with all required sections labeled correctly ▪ Clear and detailed statements about at least four of the sections of garden including justification for their inclusion and positioning	An accurate knowledge of permaculture principles has been demonstrated by: ▪ sign showing the three main attitudinal principles of permaculture with highly relevant graphics ▪ Clear and concise and diagram of the permaculture garden design with all required sections labeled correctly ▪ Clear and detailed statements about at least three of the sections of garden including justification for their inclusion and positioning	Knowledge of some elements of permaculture principles. This has been demonstrated by student producing a response to a scaffolded task with some assistance. Student may have: ▪ Drawn a sign with graphics ▪ Drawn a garden design with labelling ▪ Written statements about some of the sections of the garden	Minimal knowledge of permaculture principles demonstrated by student producing a response to a highly scaffolded task with considerable assistance.
Curriculum Literacies	▪ Skilfully and accurately communicates findings by constructing and presenting a clear, accurate and detailed diagram according to the task sheet. ▪ Has used scientific and permaculture terms correctly.	▪ Communicates findings by constructing a clear, accurate and detailed diagram according to the task sheet. ▪ Has used scientific and permaculture terms correctly.	▪ Communicates most findings by constructing a clear and accurate diagram according to the task sheet. ▪ Has attempted to use scientific and permaculture terms correctly.	Communicates findings by constructing diagrams with some assistance.	Produced a garden design and sign with considerable assistance.
Organisational Skills **Group Work**	▪ Uses skills to complete all tasks efficiently and independently ▪ Uses effective group skills at all times	▪ Uses skills to complete tasks efficiently and independently ▪ Uses effective group skills most of the time	▪ Uses skills to complete tasks independently ▪ Generally uses effective group skills	▪ Tasks managed with some support ▪ Uses group some of the time	▪ Tasks managed with considerable support support ▪ Prefers to work independently