

Programs *for* 2010



Ecolinc Programs P-10	Year Level	VELS Level	VELS Strands and Domains												
			Physical, Personal and Social Learning				Discipline Based Learning					Interdisciplinary Learning			
			Health & Physical Education	Interpersonal Development	Personal Learning	Civics & Citizenship	Science	Mathematics	Humanities Economics	Humanities Geography	Humanities History	English	Communication	Design, Creativity & Technology	ICT
Early Years															
Living in the extremes	P-2	1-2		*	*		*	*		*	*		*	*	*
Minibeasts	P-4	1-3		*	*		*	*		*	*		*	*	*
A plant's world	P-4	1-3	*	*	*		*	*		*	*		*	*	*
Bush food propagation	P-4	1-3		*	*	*	*	*		*	*		*	*	*
Sustainable art	P-4	1-3		*	*	*	*	*		*	*		*	*	*
Digging up the Diprotodon	1-4	2-3		*	*		*	*		*	*		*	*	*
Stormwater	1-4	2-3		*	*	*	*	*		*	*		*	*	*
Fascinating frogs	3-4	3		*	*	*	*	*		*	*		*	*	*
Reduce, reuse, recycle	3-4	3		*	*	*	*	*		*	*		*	*	*
What's growling in the wetland?	3-4	3		*	*	*	*	*		*	*		*	*	*
Who eats who?	3-4	3		*	*	*	*	*		*	*		*	*	*
Saving energy	4	3		*	*	*	*	*		*	*		*	*	*
Middle Years															
A plant's world	5-6	4		*	*	*	*	*		*	*		*	*	*
Bush food propagation	5-6	4		*	*	*	*	*		*	*		*	*	*
Fascinating frogs	5-6	4		*	*	*	*	*		*	*		*	*	*
Saving energy	5-6	4		*	*	*	*	*	*	*	*		*	*	*
Sustainable art	5-6	4		*	*	*	*	*		*	*		*	*	*
Digging up the Diprotodon	5-8	4-5		*	*	*	*	*		*	*		*	*	*
How clean is the wetland?	5-8	4-5		*	*	*	*	*		*	*		*	*	*
Reduce, reuse, recycle	5-8	4-5		*	*	*	*	*		*	*		*	*	*
What's growling in the wetland?	5-8	4-5		*	*	*	*	*		*	*		*	*	*
Who eats who?	5-8	4-5		*	*	*	*	*		*	*		*	*	*
Bright ideas to reduce greenhouse gas emissions	7-8	5		*	*	*	*	*	*	*	*		*	*	*
Bush foods	7-8	5		*	*	*	*	*		*	*		*	*	*
Classifying living things	7-8	5		*	*	*	*	*		*	*		*	*	*
Exploring ecosystems	7-8	5		*	*	*	*	*		*	*		*	*	*
Investigating frogs	7-8	5		*	*	*	*	*		*	*		*	*	*
Investigating salinity, soil & water quality issues	7-8	5		*	*	*	*	*		*	*		*	*	*
Plant propagation	7-8	5		*	*	*	*	*		*	*		*	*	*
Stormwater trail	7-8	5		*	*	*	*	*		*	*		*	*	*
Watching the weatherwall	7-8	5		*	*	*	*	*		*	*		*	*	*
What's under the microscope?	7-8	5		*	*	*	*	*		*	*		*	*	*
Later Years															
Bush foods	9-10	6		*	*	*	*	*		*	*		*	*	*
Capturing cells	9-10	6		*	*	*	*	*		*	*		*	*	*
Discovering diatoms	9-10	6		*	*	*	*	*		*	*		*	*	*
Environmental indicators	9-10	6		*	*	*	*	*		*	*		*	*	*
Exploring ecosystems	9-10	6		*	*	*	*	*		*	*		*	*	*
Extracting plant DNA	9-10	6		*	*	*	*	*		*	*		*	*	*
Extracting plant pigments	9-10	6		*	*	*	*	*		*	*		*	*	*
Grassland ecology	9-10	6		*	*	*	*	*		*	*		*	*	*
How real is climate change?	9-10	6		*	*	*	*	*	*	*	*		*	*	*
Investigating salinity, soil & water quality issues	9-10	6		*	*	*	*	*		*	*		*	*	*
Managing ecosystems	9-10	6		*	*	*	*	*		*	*		*	*	*
Plant propagation techniques	9-10	6		*	*	*	*	*		*	*		*	*	*
Soil chemistry	9-10	6		*	*	*	*	*		*	*		*	*	*
Stormwater trail	9-10	6		*	*	*	*	*		*	*		*	*	*
Watching the weatherwall	9-10	6		*	*	*	*	*		*	*		*	*	*
Wetland energy transfer	9-10	6		*	*	*	*	*		*	*		*	*	*

This information is correct at the time of printing however may be subject to change.



FULL DAY PROGRAMS

Key: 🌱 Life 💧 Water ⚡ Energy 🌀 Air 🏔 Earth 🏠 Field Trip

- new** 🌱 Living in the extremes: P-2 Investigate how wetland plants and animals survive extreme conditions including drought.
- 🌱 Minibeasts: P-4 Examine the wonderful world of minibeasts including wetland macroinvertebrates and compost critters.
- new** 🌱 A plant's world: P-6 Be a plant detective and explore the indigenous plant garden and vegetable patch. Propagate indigenous seeds and cuttings in the glasshouse.
- new** 🌱 Bush food propagation: P-6 Explore the Ecolinc wetland trail and investigate traditional aboriginal food, fibre and healing plants. Collect seeds and propagate a range of bush foods.
- new** 🌱 Sustainable art: P-6 Use the Ecolinc sustainability and wetland trails to create sustainable artworks.
- 💧 Stormwater: 1-4 Explore the Ecolinc stormwater wetland and the effects of pollution in an aquatic ecosystem.
- new** 🌱 Digging up the Diprotodon: 1-8 Follow Ecolinc's geological trail, learn about the discovery of the Diprotodon in Bacchus Marsh and the world of the megafauna using casts of megafauna trackways, and conduct a 'dig' to find your own fossil.
- new** 🌱 Fascinating frogs: 3-6 Take a walk around the Ecolinc wetland to hear the frog chorus. Investigate the life cycle of frogs, habitat requirements and identification calls.
- new** ⚡ Reduce, reuse, recycle: 3-8 Complete the Sustainability Trail and investigate options for reducing, reusing and recycling.
- 🌱 What's growling in the wetland? 3-8 Complete the wetland trail and discover the diverse aquatic animals and plants that live in this ecosystem.
- 🌱 Who eats who? 3-8 Explore the relationships between aquatic animals and plants in the wetland by sampling the wetland and determining 'who eats who?'
- 🌀 Saving Energy: 4-6 Explore Ecolinc's energy saving features on the Sustainability Trail. Use models to investigate energy use and alternate energy options.
- 💧 How clean is the wetland? 5-8 Conduct chemical testing and macroinvertebrate identification to determine the quality of the Ecolinc stormwater wetland.
- 🌀 Bright ideas to reduce greenhouse gas emissions: 7-8 Complete the Sustainability Trail and explore design features and alternative energy options to save energy. Investigate how greenhouse gases impact on the environment and explore alternative fuel sources.

🌱💧🏠 Classifying living things: 7-8

Examine the Ecolinc wetland ecosystem and classify aquatic/terrestrial plants and animals using a variety of keys. Optional extensions at Mt Rothwell* include quadrat sampling and an investigation of habitat and species interactions in a natural grassy woodland ecosystem, and/or a dusk walk to reveal a range of endangered nocturnal mammal species.

🌱 Plant propagation: 7-8 Propagate indigenous seeds and cuttings in the glasshouse and shadehouse.

🌱 What's under the microscope? 7-8

Explore the microscopic world of plants and animals.

🌱 Investigating frogs: 7-8

Discover methods for identifying frogs and assess frog habitat quality in the Ecolinc stormwater wetland and the Werribee River.

new 🌱 Bush foods: 7-10 Discover a range of bush foods in the Ecolinc grassland/wetland. Investigate traditional aboriginal food, fibre and healing plants and corresponding land management practices.

🌱 Exploring Ecosystems: 7-10

Investigate a range of 'grassy woodland' plants and animals at Ecolinc followed by a visit to nearby Mt Rothwell* to investigate management strategies for a variety of endangered species. An optional dusk walk reveals a range of endangered nocturnal mammal species including eastern quolls, brush-tailed rock wallabies and eastern barred bandicoots.

💧🌱 Investigating salinity, soil and water quality issues: 7-10

Explore the Balliang and Werribee River areas to conduct field work investigating a range of land management issues, followed by interpretation activities at Ecolinc.

💧🌱 Stormwater trail: 7-10 Explore the Moorabool Shire Council stormwater trail along the Werribee River. Investigate how stormwater travels into the river and the Ecolinc stormwater wetland. Determine potential effects on living things and possible management strategies to reduce stormwater pollution. Examine the Ecolinc wetland's ability to clean stormwater by conducting various chemical and biological tests.

🌀 Watching the weatherwall: 7-10

Explore Ecolinc's CSIRO designed weatherwall. Record your own weather measurements and examine past data to investigate climate change.

new 🌱 Capturing cells: 9-10

Investigate cell structure and function using organisms from the Ecolinc stormwater wetland. Explore mitosis and meiosis.

new 🌱💧 Discovering diatoms: 9-10 Discover the world of diatoms in the Ecolinc stormwater wetland. Use keys to distinguish between diatoms and investigate their unique functions.

💧🌱 Environmental indicators: 9-10 Use chemical and biological indicators to determine the quality of the Ecolinc stormwater wetland. Compare with a range of other water samples.

🌱 Extracting plant DNA: 9-10 Explore plant DNA extraction.

🌱 Extracting plant pigments: 9-10 Use thin layer chromatography to separate and identify a variety of plant pigments.

new 🌱🌀 Grassland ecology 9-10 Use survey techniques including transects and quadrats to assess habitat quality, species abundance and diversity in the Ecolinc grassland. Investigate relationships and interactions between the abiotic and biotic components of the ecosystem. An opportunity to survey a natural grassland at nearby Mt Rothwell* may be included as an option. Terms 1 and 4 are recommended for this program.

🌀 How real is climate change? 9-10 Investigate climate change issues by exploring Ecolinc's ecologically sustainably designed (ESD) facility and alternate energy sources. Calculate annual greenhouse gas emissions and discuss strategies for reducing our impact on the environment.

🌱💧🌱 Managing Ecosystems: 9-10 Use habitat surveys to determine the effectiveness of management strategies along a section of the Werribee River. Travel to Mt Rothwell* to examine a grassy woodland habitat and management strategies currently in place. An optional dusk walk reveals a range of endangered mammal species.

🌱 Plant propagation techniques: 9-10 Discover how the Wollemi Pine was discovered and propagated using plant tissue culture techniques in the laboratory. Compare with traditional plant propagation methods.

new 🏔 Soil chemistry: 9-10 Explore the Ecolinc geological trail and measure a number of soil properties including colour, dispersion, texture, pH and electrical conductivity to distinguish a range of soil types.

🌱💧🌀 Wetland energy transfer: 9-10

Sample the wetland for organisms, construct food chains, classify organisms into trophic levels and examine the flow of energy in the wetland.

VCE Environmental Science

Programs for VCE

2010

Unit 1: The Environment

AoS 3 Ecosystems (half day program)

To complete Outcome 3, conduct practical investigations involving sampling and identifying macroinvertebrates in the wetland. Investigate the interactions between organisms by constructing food chains and food webs. Classify organisms into trophic levels and explore energy flow. Use a computer program to model environmental changes in the wetland ecosystem and describe their effects. This program may be extended by including an investigation of a grassy woodland ecosystem at Mt Rothwell*. An optional dusk walk reveals a range of endangered mammal species.

Unit 2: Monitoring the environment

AoS 1 Environmental indicators (full day program)

To complete Outcome 1, conduct field work to investigate environmental indicators including turbidity, pH, nitrates, dissolved oxygen and the presence/absence of pollution intolerant macroinvertebrate species to determine the ecological health of the wetland and river ecosystem.

Unit 3: Ecological issues: energy and biodiversity

AoS 1 Energy and global warming (full day program)

To complete SAC Outcome 1, use Ecolinc's award winning ESD facility and energy source equipment to investigate ways of increasing energy efficiency to reduce the enhanced greenhouse effect. Explore Ecolinc's efficiency and resulting environmental impacts.

AoS 2 Diversity in the biosphere (full day program)

To complete SAC Outcome 2, investigate the eastern barred bandicoot's habitat requirements, significance, threats and captive breeding data. Travel to Mt Rothwell* to complete a habitat assessment, explore methods for protecting remaining populations and participate in a dusk walk to see a range of endangered species including the eastern barred bandicoot, brush-tailed rock wallaby and eastern quoll.

Unit 4: Ecological sustainability

AoS 1 Pollution and health (full day program)

To complete SAC Outcome 1, collect primary data on SO₂ and NO₂ emissions using colorimetry. Examine the effects posed by SO₂ and NO₂ to human health and the environment. Evaluate protocols for reducing the risks associated with NO₂.

VCE Chemistry

Unit 2: Environmental chemistry

AoS 1 Water (full day program)

To complete Outcome 1, an extended experimental investigation including a Risk Assessment, investigate the role of water in maintaining life in the Ecolinc stormwater wetland. Use a variety of data logging probes to measure variables including pH, electrical conductivity, dissolved oxygen, nitrates and phosphates, and compare results with environmental standards. Use atomic absorption spectroscopy (AAS) to measure the sodium concentration of the Ecolinc wetland and other water samples.

AoS 2 The atmosphere (full day program)

To complete Outcome 2, this activity can be completed as a summary report including annotations of three practical activities OR as an extended investigation.

- Measure atmospheric O₂ and CO₂ at Ecolinc, and dissolved O₂ and CO₂ in Ecolinc's stormwater wetland and other water samples.
- Extract and calculate the SO₂ concentration in the air at Ecolinc using colorimetry. Use the weatherwall to track weather conditions on the day of sampling.
- Extract and calculate the NO₂ concentration in the air at Ecolinc using colorimetry. Verify results using the ultraviolet/visible (UV-VIS) spectrophotometer. Use the weatherwall to track weather conditions on the day of sampling and compare results with nearby air monitoring stations.

Unit 3: Chemical pathways

AoS 1 Chemical analysis (full day program)

To complete SAC Outcome 1 Task 1 – an extended experimental investigation including a Risk Assessment, or, Task 3 – analysis of qualitative / quantitative data (if the extended experimental investigation is completed from AoS 2), evaluate the suitability of techniques and instruments used in chemical analyses including atomic absorption spectroscopy (AAS), infrared spectroscopy (IR), and ultraviolet/visible spectroscopy (UV-VIS).

- AAS: determine metal concentrations in commercial products e.g. calcium in milk.
- UV-VIS: determine the protein content of common foods e.g. milk samples.
- IR: obtain and interpret IR spectrographs for commercial products e.g. milk samples.

VCE Biology

Unit 1: Unity and Diversity

(Choose either/both of the following half day programs)

AoS 1 Cells in action

To complete Outcome 1, use compound light microscopes to study plant and animal cell structure. Prepare and examine temporary slides using different staining techniques and investigate osmosis under the microscope.

AoS 2 Functioning organisms

To complete Outcome 2, conduct micropropagation (plant tissue culture) in the laboratory to examine how plants obtain nutrients, energy and water whilst growing in test tubes.

Unit 2: Organisms and their environment

(Choose either/both of the following half day programs)

AoS 1 Adaptations of organisms

To complete Outcome 1, undertake practical investigations examining the wetland ecosystem by identifying environmental factors, adaptations of aquatic species; structural, physiological, behavioural and reproductive features, and distribution of living things.

AoS 2 Dynamic ecosystems

To complete Outcome 2, conduct field investigations exploring the interactions of living things in their wetland ecosystem. Sample and identify the wetland for macroinvertebrates, examine relationships between organisms, classify organisms into trophic levels and construct energy flow pyramids. Use a computer program to model the effects of human induced changes, such as pollution on the wetland ecosystem. This program may be extended by including an investigation of a grassy woodland ecosystem for comparison at nearby Mt Rothwell*. An optional dusk walk reveals a range of endangered nocturnal mammal species including eastern quolls, brush-tailed rock wallabies and eastern barred bandicoots.

Unit 3: Signatures of life

AoS 1 Molecules of life (full day program)

To complete SAC Outcome 1, investigate energy transformations within plants through the process of photosynthesis.

AoS 2 Detecting and responding (half or full day program)

To complete SAC Outcome 2, conduct micropropagation (plant tissue culture) in the laboratory and use plant tissue cultures to examine the effects of auxin and cytokinin on root and shoot development.

Unit 4: Continuity and change

AoS 1 Heredity (full day program)

To complete SAC Outcome 1, detect genetically modified organisms in foods using PCR and gel electrophoresis techniques.

VCE Physics

Unit 2

AoS 3 Detailed study (full day program)

Investigations: Alternative energy sources

For Outcome 3.3 use Ecolinc's award winning ESD design features, Building Maintenance System data and energy source equipment, to initiate or conclude an investigation into alternate energy sources.

Other ECOLINC Programs

Ecolinc designs, by request, environmental programs for:

- the Victorian Certificate of Applied Learning (VCAL) e.g. Horticulture, Numeracy, Sustainability
- the International Baccalaureate (IB)
- VCE Outdoor and Environmental Studies.

Ecolinc will develop programs to suit individual class requirements and curriculum needs however these must be booked well in advance. A range of teacher professional learning programs are held throughout the year. Requests for particular themes are welcome. Free introductory tours of Ecolinc are always available for school staff.

Special Events in 2010

- Ecolinc will celebrate Education Week in May, National Science Week in August, National Water Week and Children's Week in October with a range of new programs.
- Ecolinc will participate in MooraFest, a community festival focusing on sustainability, organized in conjunction with the Moorabool Shire Council.
- Ecolinc will display a number of 'Megafauna Trackways', on loan from the University of Ballarat. The trackways casts feature stunning footprints from long extinct megafauna including the Diprotodon, giant kangaroo and giant wombat.

View the website www.ecolinc.vic.edu.au or subscribe to the Ecolinc newsletter 'Newsline' for further details and dates for the above events.

Prices

Please contact Ecolinc for current program charges.

* Programs linked to Mt Rothwell attract an additional fee per student, payable to Mt Rothwell.

Facility Hire

The Ecolinc Conference Room and Information Resource Centre are available for hire for your next staff meeting, conference or professional learning activity.

- Conference Room (audio visual presentation equipment and hospitality facilities available, seats 100)
- Information Resource Centre (presentation facilities including laptop and plasma screen technology, seats 28)

Hire costs available on application.

Ecolinc Partners

Key stakeholders:

- Department of Education and Early Childhood Development
- Bacchus Marsh College
- University of Ballarat
- Moorabool Shire Council



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