

# Living Systems

## Investigations in a Changing Ecosystem

This experience engages students in an investigation of an indigenous woodland ecosystem at La Trobe University's Outdoor Laboratory. Students explore the recreated woodland and wetlands habitat while answering questions that link to Unit I Biology outcomes. In the full day experience, students undertake a practical experiment that provides quantitative data on Ecological health.

### Learning Intention

Students will identify aspects of adaptation, community interactions, dependencies and also be introduced to classification of animals and plants into groups.

Students will be able to collect, identify and analyse a variety of evidence from a field investigation and relate this to the survival (and conservation) of a threatened species.

### Success Criteria

Students will complete the questions outlined in the students workbook, based on the information provided throughout the experience.

### Student Activity

Students investigate the history of Australian woodlands in a guided wander through the La Trobe Wildlife Sanctuary, La Trobe University's 30-hectare outdoor laboratory. Students also engage with a scientific methodology for the investigation and interpretation of a terrestrial and/or aquatic ecosystem and learn about the adaptations of animals and plants to the changing climate. This program is divided into two two-hour sessions. One session involves the development of understandings for Area of Study 2, with an emphasis on indigenous plants and animals and how these have changed over time, as well as discussions around history, human impacts and fire ecology. The session also enhances understanding of biodiversity concepts and relationships between organisms. The second session involves a practical investigation of a wetland or woodland ecosystem, with appropriate methodology and data collection techniques to enable completion of outcomes in Area of Study 3. Groups can choose to do either one of the two-hour sessions or the full day session. Student notes and teacher guide for School Assessed Coursework (SAC) materials are provided.

### Learning Outcomes

Cognitive	Students will use their senses to make observations. They will inquire about animal features and adaptations, plant and animal communities and their interactions. They will compare different features of different animals and plants.
Affective	Students will be curious about the environment around them and develop deep understandings about how humans have impacted the ecology of the Melbourne region in a short period of time.
Observational Skills	Students observe the physical representations of adaptations and historical impacts in the evidence that is present throughout the Sanctuary.

#### A New Pedagogy Deep Learning (NPDL)

The LTWS incorporates the work of Michael Fullan and Maria Langworthy into their activities and support resources.

Activities are based around the **5e Instructional Model** and incorporate a range of activities designed to develop 21<sup>st</sup> Century Learning Skills.

The Living Systems experience directly encourages the skills of Critical Thinking, Communication, Collaboration and Citizenship, under their NPDL framework.

For more information - <http://bit.ly/2kiWIRq>

Get more information about the Wildlife Sanctuary and their Education Experiences by visiting our webpage:

[latrobe.edu.au/wildlife](http://latrobe.edu.au/wildlife)

You will also find us on social media



## La Trobe University's Outdoor Laboratory

Critical Thinking



Communication



Collaboration



Creativity



Character



Citizenship



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### Curriculum Links - VCE Biology Unit 1

#### Area of Study 2 - How do living systems sustain life?

- the structural, physiological and behavioural adaptations that enhance an organism's survival and enable life to exist in a wide range of environments
- classification of biodiversity, past and present, into taxonomic groups based on shared morphological and molecular characteristics, and naming using binomial nomenclature
- strategies for managing Earth's biodiversity to support the conservation of species and as a reservoir for the bio-prospecting of new food sources and medicinal drugs.
- the beneficial, harmful and benign relationships between species including amensalism, commensalism, mutualism, parasitism and predation
- interdependencies between species as represented by food webs, including impact of changes to keystone species
- the distribution, density and size of a population of a particular species within an ecosystem and the impacts of factors including available resources, predation, competition, disease, chance environmental events, births, deaths and migration.

#### Area of Study 3 - Practical investigation

- the biological concepts specific to the investigation and their significance, including definitions of key terms, and biological representations
- the characteristics of scientific research methodologies and techniques of primary qualitative and quantitative data collection relevant to the investigation: laboratory work (microscopy), fieldwork (quadrats, transects and field guides) and/or observational studies of animal behaviour; precision, accuracy, reliability and validity of data; and minimisation of experimental bias
- ethics and issues of research including identification and application of relevant health, safety and bioethical guidelines
- methods of organising, analysing and evaluating primary data to identify patterns and relationships including sources of error and limitations of data and methodologies
- the nature of evidence that supports or refutes a hypothesis, model or theory
- options, strategies or solutions to issues related to organism or species survival
- the key findings of the selected investigation and their relationship to ecological concepts
- the conventions of scientific report writing including biological terminology and representations, standard abbreviations and units of measurement.



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