

Ecosystem Dynamics – Population Dynamics (Full Day Program) | Stage 6 | Biology

Students work scientifically and achieve fieldwork outcomes.

Note: This excursion can also be used as a model for a **DEPTH STUDY (5 hours)**.

Summary	Duration
<p>This excursion addresses outcomes from the NESA Stage 6 Biology</p> <p><i>Focus</i> – ‘Ecosystem Dynamics’ – Population Dynamics</p> <p>This unique and highly engaging program allows students to perform a first-hand investigation to measure a range of abiotic and biotic factors in a freshwater ecosystem using various scientific equipment and data collection methods. Students measure populations of organisms using sampling techniques. Students then analyse the data collected and observe the abiotic-biotic relationships that exist and their interdependence. An example of a recent local extinction event through predation is explained. There is also a look at past and future ecosystems at Penrith Lakes.</p> <p>Students are guaranteed to be involved in a number of engaging and hands on experiences during the course of the day. Through these students will further develop their knowledge and understanding, fieldwork and group work skills.</p>	<p>Approximately 4 hour on-site excursion to Penrith Lakes Environmental Education Centre.</p> <p><i>Arrival time</i> - 10:00am <i>Departure time</i> – 2:00pm</p> <p>Arrival and departure times are guides only. Distance and bus schedules may require modifications to the timetable.</p>

About Penrith Lakes	Learning across the curriculum
<p>Penrith Lakes Environmental Education Centre is located on Old Castlereagh road inside the Sydney International Regatta Centre. This great location allows us to provide studies of land and water management at Penrith Lakes along with local heritage sites and the environmental issues associated with the Nepean River, Yarramundi Lagoon and the Blue Mountains.</p>	<p><i>Cross-curriculum priorities enable students to develop understanding about and address the contemporary issues they face.</i></p> <p>Sustainability is concerned with the ongoing capacity of the Earth to maintain all life. It provides authentic contexts for exploring, investigating and understanding systems in the natural and made environments. Relationships, cycles and cause and effect are explored, and students develop observation and analytical skills to examine these relationships in the world around them to design solutions to identified sustainability problems.</p>

Key Inquiry questions

- What effect can one species have on another species in a community?
- How can human activity impact on an ecosystem?

Outcomes for students

A Student

- analyses ecosystem dynamics and the interrelationships of organisms within the ecosystem BIO11-11

Students:

- investigate and determine relationships between biotic and abiotic factors in an ecosystem, including: (ACSBL019)
 - the impact of abiotic factors (ACSBL021, ACSBL022, ACSBL025)
 - the impact of biotic factors (ACSBL024)
 - the ecological niches occupied by species (ACSBL023)
 - measuring populations of organisms using sampling techniques (ACSBL003, ACSBL015)
- explain a recent extinction event (ACSBL024)
- investigate changes in past ecosystems that may inform our approach to the management of future ecosystems
- investigate practices used to restore damaged ecosystems, Country or Place, e.g.:
 - mining sites
 - land degradation from agricultural practices

1. PRE Excursion Teaching and learning activities

- Why do we conduct fieldwork?
- How can we conduct fieldwork?
- What is the Penrith Lakes Parkland?
- What are we investigating on our excursion to Penrith Lakes?
- How are we investigating on our excursion to Penrith Lakes?

Resources

Penrith Lakes Parkland Draft Vision Plan (on PLEEC website)
penrithlakes.com.au (as at 29/10/17 new site under construction)

2. Teaching and learning activities on the excursion day	Resources
<ul style="list-style-type: none"> • Activity 1: Introduction to Penrith Lakes and abiotic instrument instruction. • Activity 2: Water Testing • Activity 3: Dipnetting, Invertebrate ID, population measurement and interpretation of results. • Activity 4: Bird Observation. Measuring abundance and distribution. Assessment of data. • Activity 5: Wrap Up <ul style="list-style-type: none"> - Relationships between abiotic and biotic factors. How healthy is the ecosystem? - Past, present and future ecosystems at Penrith Lakes. (Human impacts) - Freshwater ecosystems food web and a local extinction event 	<p>Provided by PLEEC:</p> <ul style="list-style-type: none"> ▪ Freshwater ecosystem with invertebrates ▪ Water testing equipment ▪ Dip nets ▪ Magnifiers ▪ Binoculars <p>Provided by visiting school:</p> <ul style="list-style-type: none"> ▪ Clipboards ▪ Student hats ▪ Sunscreen ▪ First aid kit and student medications

3. POST Excursion Teaching and learning activities	Resources
<ul style="list-style-type: none"> • Present a report on the question – How healthy are Penrith Lakes? Give reasons. • Suggestions for a student driven Depth Study investigation. (suggestions are numerous) <ul style="list-style-type: none"> For example: Can mining sites be restored to their original condition? What factors impact on water quality in a lake? What conditions are necessary for waterbird populations to recolonise degraded sites? 	<p>Abiotic measures explanation (PLEEC website)</p> <p>Historical data on abiotic measures (PLEEC website)</p>