



Stage 6 – Biology

Ecosystem Dynamics

Bateau Bay

Program Overview

Students will use an inquiry leaning model to investigate the population dynamics of local ecosystems and determine relationships between biotic and abiotic factors. The future of ecosystems will also be examined with discussions of management options and the perspective of stakeholders.

Key Questions

1. What effect can one species have on the other species in a community?
2. How do abiotic factors such as tides and wave exposure affect the distribution of species on the rock platform?
3. How do biological interactions affect the distribution of species on the rock platform?
4. Do the assemblages of organisms vary within the rock platform's microhabitats?

Learning Experiences & Content

Working Scientifically

Field work activities include:

- use of transects and quadrats to measure distribution and abundance of plants and animals
- wildlife observation with reference to field guides and identification APPS
- measurement of physical and chemical abiotic factors
- observations of predation, competition and symbiotic relationships amongst local species
- practical observations and discussion of adaptations of plant and animal species
- discussion of environmental pressures that promote a change in species diversity and abundance

Adaptations to Life on a Rock Platform

Students investigate the diversity of life on a rock platform and identify key features such as feeding, attachment and shape.

Distribution and abundance of target species

A species area curve will be used to determine 'how many' samples (replicates) are required to



achieve a satisfactory representation of a given ecosystem. Students will then use transects and quadrats to survey species distribution from high to low zones.

Abiotic Factors and species diversity in micro-habitats

Investigating abiotic factors (temperature, pH and salinity) and species assemblages between different habitats.



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Outcomes

Biology – Stage 6

- ✿ **BIO11/12-1** develops and evaluates questions and hypotheses for scientific investigation.
- ✿ **BIO11/12-2** designs and evaluates investigations in order to obtain primary and secondary data and information.
- ✿ **BIO11/12-3** conducts investigations to collect valid and reliable primary and secondary data and information.
- ✿ **BIO11/12-4** selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media.
- ✿ **BIO11/12-5** analyses and evaluates primary and secondary data and information.
- ✿ **BIO11/12-11** analyses ecosystem dynamics and the interrelationships of organisms within the ecosystem.

Science Content

Ecosystem case study

Students:

- ✿ Investigate and determine relationships between biotic and abiotic factors in an ecosystem, including:
 - the impact of abiotic factors
 - the impact of biotic factors, including predation, competition and symbiotic relationships
 - the ecological niches occupied by species
 - predicting consequences for populations in ecosystems due to predation, competition, symbiosis and disease
 - measuring populations of organisms using sampling techniques.

