

Programme Outline

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Small Animal Study (Bio 3.1)

LOCATION:	NMIT Laboratory, at the Cawthron Aquaculture Park, Glenda, Nelson.
PROGRAMME DESCRIPTION:	<p>University of Otago (NZMSC) staff are joined by Cawthron Institute Education staff to guide students through the background biology of the green-lipped mussel (<i>Perna canalicula</i>), and provide encouragement and advice while they carry out a practical investigations of their own design, to fit with the requirements of NCEA Biology 3.1 AS 91601.</p> <p>The programme is in two stages: Cawthron and NZMSC staff visit the school (or skype if needed) to present background information about the programme and biology of the green lipped (Green shell TM) mussel. An explanatory mussel dissection is carried out, along with a review of some of the techniques used in aquaculture, what is known about the animal's physiology, behaviour, feeding patterns and senses. A review of possible investigations that could be carried out, along with available equipment and correct scientific investigation techniques are reviewed.</p> <p>Two full days are then spent at the NMIT/Cawthron Lab facilities conducting the investigations. During this time students also have access to Cawthron Scientists, many of whom are world leaders in aquaculture research and mussels in particular.</p>
LEARNING OUTCOMES:	<ul style="list-style-type: none">• Students will extend and apply concepts of adaptation and ecological niche to design and carry out their own practical biological investigation.• Students will formulate a sound hypothesis and devise a rigorous experimental methodology.• Students carry out practical research and collect data that is both valid and reliable.• Students will be able to make connections between their own research and that of others and wider biological concepts. <p>Extra outcomes:</p> <p>Students learn to be biologists, in their own right, rather than students in a biology class.</p> <p>Students may gain an appreciation of marine science as a possible field of future study or a career.</p>
YEAR/LEVEL:	Year 13, Level 8
CURRICULUM LINKS:	Living World:level 8, life processes, ecology and evolution.Understand the relationship between organisms And their environment. Develop and carry out investigations that extend their science knowledge.
KEY COMPETENCIES:	Thinking, language symbols and text, managing self . Nature of Science: understanding, investigating, communicating, participating and contributing.
PRE TRIP PREPARATION:	Students should have a fairly clear understanding of what aspect of mussels and how they intend to carry out the investigation prior to arriving at the Cawthron Aquaculture Park. Hypothesis formation, equipment requirements and the number of animals needed should be complete and if necessary discussed with NZMSC/Cawthron staff beforehand. All study animals are supplied by Cawthron, due to quarantine restrictions at the site. No ethical issues surround the use of mussels in experiments.
RESOURCES AVAILABLE TO SUPPORT PROGRAMME	Cawthron Scientists and technical staff are available on site for brief discussions, knowledge and advice.
RELATED TOPICS:	Aquaculture, Animal behaviour
PROGRAMME COSTS:	None.

The NZ Marine Studies Centre is part of the Marine Science Department, University of Otago.
This programme is supported by the Ministry of Education's LEOTC service.
See WWW.MARINE.AC.NZ for more programmes and resources.

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PROGRAMME LENGTH:	In school presentation (double period), and two full days at the research facility.
GROUP INFORMATION:	Laboratory space is limited and only available for 3 weeks per year, generally timed to be during the first 3 weeks of term 2. Classes must be pre-booked early in the new year,
SAFETY ACTION PLAN:	NMIT/Cawthron Laboratory rules apply while on site. No food or drink in the labs, closed-in footwear. Don't touch equipment already set up in labs.
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