

Diversity in Form and Function

LOCATION: NZ Marine Studies Centre, Portobello, Dunedin

PROGRAMME DESCRIPTION:

This programme provides practical hands-on experiences in support of achievement standard 91155. Understanding animal (and plant) adaptations in relation to their way of life. An introduction to the marine and intertidal environment sets the scene for exploring the connection between adaptations and niche. Students are guided through a dissection that deconstructs form in relation to function with reference to the organisms' environments and niches. A range of live marine animals are interpreted for students with particular reference to a particular life process focus determined by the teacher (one of: gas exchange and circulation, feeding and nutrition or reproduction). A review places the specific experiences into the introductory framework.

Extensions: Most commonly this programme is done in conjunction with Intertidal Investigations programme connected to AS 91158. Besides variations depending on the life process focus desired, teachers can also request a customised programme that relates to the particular marine environment they use for AS 91158.

LEARNING OUTCOMES:

Students will:

- Increase understanding of the relationship between niche and adaptation.
- Gain first-hand experience with animal forms and their morphology.
- Develop an understanding of the relationship between morphology and functionality in the context of survival in a particular niche.

Extras:

Gain a new or renewed appreciation for marine life and the marine environment.

Students will gain an understanding of marine science as a possible field of study or a future career.

YEAR/LEVEL: Year 12, Biology level 7

CURRICULUM LINKS:

Nature of Science (NoS): level 7 understanding, investigating, participating and contributing. Science: Living World, Life Processes. AS 91155 Understanding animal (and plant) adaptations in relation to their way of life.

KEY COMPETENCIES: Thinking, using language, symbols and text, managing self, relating to others. Nature of Science: understanding, investigating.

PRE TRIP PREPARATION: a general understanding of niche and adaptation would be helpful. Background to the life process under scrutiny (one of: gas exchange and circulation, feeding and nutrition or reproduction).

RESOURCES AVAILABLE TO SUPPORT PROGRAMME:

A student booklet for photocopying is sent out with booking confirmation.

The NZ Marine Studies Centre is part of the Marine Science Department, University of Otago.

RELATED TOPICS: evel 7. Life Processes – Ecology - Explore ecological distributon patterns and explain possible causes of these patterns. AS 91158 Investigate a pattern in an ecological community, with supervision.

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PROGRAMME COSTS: \$12.00 per student (GST excl.)

PROGRAMME LENGTH: 3 hours.

GROUP INFORMATION: Groups of 15 or more are preferred, up to a maximum of 60 students.
With 20 or more students we divide the group and rotate through activities.

SAFETY ACTION PLAN:

In the field: as per field operations.

In Laboratory: as per Lab safety.

Covid guidelines: as per Government and University of Otago operations.

NZMSC CONTACT: Rob Lewis

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Example itinerary

10.00 am

Arrive at NZ Marine studies centre

LAB: Intro and overview of programme

10.15 am

AQUARIUM: close look at feeding and nutrition in bivalves and other filter feeders.

Intertidal adaptations, including feeding in a molluscan grazer and grazing echinoderm.

10.45 am

LAB: External and internal structures of crustacean

11.15 am

Morning tea

11.30 am

AQUARIUM: Investigating chemo sensing feeding activity molluscs

(scavenger/predator). Detritus feeders in crustaceans and echinoderms. Diversity of feeding strategies by fish species.

12.00pm

LAB: External and internal structures of sharks

12.45 pm

Review of the day

1.00 pm

Opportunity to stay for lunch / Depart NZ Marine studies centre