

Marine Plastics, from Micro to Macro

LOCATION: NZ Marine Studies Centre, Portobello, Dunedin / Coastline local to the school

PROGRAMME DESCRIPTION:

Investigate ocean currents and anthropogenic impacts through a survey of ocean litter, where data collected feeds directly into the NZ waste legislation. Provides students with the training, equipment and technology to take part as 'Citizen Scientists' in the Litter Intelligence Project. An introduction to the intertidal environment and identification of the most common intertidal species. Students are guided to take abiotic measurements with instruments provided.

Extensions: Most commonly this programme is done in conjunction with Diversity in Form and Function.

LEARNING OUTCOMES

Students will:

- Increase understanding of the role abiotic and biotic factors play in the distribution of marine plastics.
- Identify some common intertidal species and relate plastics to their survival.
- Carry out a practical survey of the distribution of marine plastics in the intertidal environment.
- Identify some general types of plastics and their origins from catchment to the intertidal environment from data collected.
- Increase understanding of the factors that cause the process of ocean litter, how they are affecting the environment and how they might be mitigated.

Extras

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

Gain an introduction to ways in which the general public can be involved in 'citizen science'.

YEAR/LEVEL

CURRICULUM LINKS

Nature of Science (NoS): level 7, understanding, investigating, participating and contributing (particularly if students use the [Litter Intelligence website](#) to load data and use information).

Science: Can provide either formative or summative assessment for A.S. 91188, A.S 91411, A.S. 91602 and A.S. 90926.

KEY COMPETENCIES: Thinking, using language, symbols and text, managing self, relating to others.

PRE TRIP PREPARATION: Teachers should share and unpack the relevant achievement standard and assessment criteria with the students before coming. Some general background on tidal cycle and conceptual ideas related to patterns in the environment (Gause's exclusion principle, niche partitioning, potential and realized niche, adaptation=niche 'fit', limiting factors, tolerance limits)

RESOURCES AVAILABLE TO SUPPORT PROGRAMME

Litter Intelligence [website](#).

A student booklet with supporting worksheets can be supplied with booking confirmation.

Class sets of [Shore Species ID guides](#).

RELATED TOPICS: Life Processes, explore the diverse ways in which animals and plants carry out life processes. Form and function, understanding animal adaptations in relation to their way of life.

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PROGRAMME COSTS: \$16.00 per student (GST excl.)

PROGRAMME LENGTH: 4 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

LAB: Understanding process of litter. Intro to the rocky shore, abiotic factors and tides.

10.45 am

Morning tea

11.00 am (time dependent on low tide)

Shore survey!

LAB: Preparation of methods and gear

SHORE: survey shore using transect method finding litter. Measure abiotic factors.

Identify species found in the intertidal zone.

12.00 pm

Measure and categorize litter data, compare to coastlines across Aotearoa.

12.30 pm

Lunch

1.00 pm

Plastics investigation, measure impact on a filter feeder (mussel) using 3 treatments and dissection. Review of data.

2.30 pm

Depart NZ Marine Studies Centre.

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.