

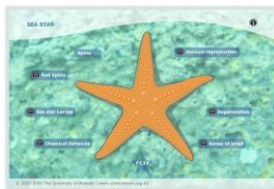
Adaptation is an evolutionary process whereby an organism becomes increasingly well suited to living in a particular habitat. Marine organisms have adapted to a great diversity of habitats and distinctive environmental conditions.

This worksheet offers a suggested pathway through Science Learning Hub education resources and connects to relevant programmes offered by NZ Marine Studies Centre. Click on the links below to create your own personalised teaching unit. Feel free to use this material in any combination or order.

Images from [www.sciencelearn.org.nz](http://www.sciencelearn.org.nz)

## Exploring the theme

**Focus question: Look closely at one of these marine species and identify similarities and differences with humans.**



- [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Animations-and-Interactives/Sea-star](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Animations-and-Interactives/Sea-star)
- [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Images/Large-crayfish](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Images/Large-crayfish)
- [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Images/Blue-cod](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Images/Blue-cod)
- [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Images/Bottlenose-dolphins](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Images/Bottlenose-dolphins)

**Activities – use these activities to expand on the focus question:**

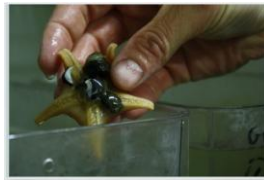
- Develop a classification system [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Teaching-and-Learning-Approaches/Develop-a-classification-system](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Teaching-and-Learning-Approaches/Develop-a-classification-system)
- Seashore drama  
[www.otago.ac.nz/marinestudies/resources/download/sea\\_shore\\_drama%20.pdf](http://www.otago.ac.nz/marinestudies/resources/download/sea_shore_drama%20.pdf)

## Understanding the theme

**Focus question: How are different marine organisms adapted to the environmental conditions in the sea?**

- Key terms > See adaptation [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Key-Terms](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Key-Terms)
- Info sheet > Adaptations of marine organisms [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Science-Ideas-and-Concepts/Adaptations-of-marine-organisms](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Science-Ideas-and-Concepts/Adaptations-of-marine-organisms)
- Info sheet > Environmental conditions affecting the sea  
[www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Science-Ideas-and-Concepts/Environmental-conditions-affecting-the-sea](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Science-Ideas-and-Concepts/Environmental-conditions-affecting-the-sea)
- Cockles: [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Looking-Closer/Cockles](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Looking-Closer/Cockles)

- Sea stars: [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Looking-Closer/Sea-stars](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Looking-Closer/Sea-stars)
- Video> Antarctic icefish [www.sciencelearn.org.nz/Science-Stories/Research-Voyage-to-Antarctica/Sci-Media/Video/Antarctic-icefish](http://www.sciencelearn.org.nz/Science-Stories/Research-Voyage-to-Antarctica/Sci-Media/Video/Antarctic-icefish)



**Activities – use these activities to expand on the focus question:**

- Survivor seashore [www.otago.ac.nz/marinstudies/resources/download/survivor.pdf](http://www.otago.ac.nz/marinstudies/resources/download/survivor.pdf)

## Applying the theme

***Focus question: In this video scientists are challenged by the ability of sea stars to drop limbs. How would this adaptation help the sea star to survive life in the sea?***



- [www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Video/How-do-you-electronically-tag-a-starfish](http://www.sciencelearn.org.nz/Contexts/Life-in-the-Sea/Sci-Media/Video/How-do-you-electronically-tag-a-starfish)

***Focus question: Think about the environmental conditions in the sea. Describe which sensory systems are most important in that environment and why.***



- [www.sciencelearn.org.nz/Contexts/The-Noisy-Reef/Sci-Media/Video/Non-visual-sensory-systems](http://www.sciencelearn.org.nz/Contexts/The-Noisy-Reef/Sci-Media/Video/Non-visual-sensory-systems)

**Activities – use these activities to expand on the focus question:**

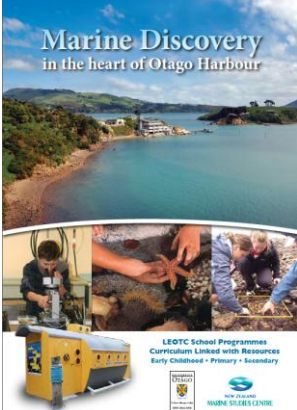
- Animal adaptations [www.sciencelearn.org.nz/Contexts/Icy-Ecosystems/Teaching-and-Learning-Approaches/Animal-adaptations](http://www.sciencelearn.org.nz/Contexts/Icy-Ecosystems/Teaching-and-Learning-Approaches/Animal-adaptations)
- Hiding in plain sight [www.sciencelearn.org.nz/Science-Stories/Research-Voyage-to-Antarctica/Hiding-in-plain-sight](http://www.sciencelearn.org.nz/Science-Stories/Research-Voyage-to-Antarctica/Hiding-in-plain-sight)
- Design a seashore species > page 28 [www.otago.ac.nz/marinstudies/resources/download/NZMSCRockyShoreActivityBook.pdf](http://www.otago.ac.nz/marinstudies/resources/download/NZMSCRockyShoreActivityBook.pdf)

## Experiencing the theme

**New Zealand Marine Studies Centre Programmes and field trips (available in Otago & Nelson) include explorations of the coastal environment, laboratory sessions, boat trips and aquarium adventures.**

W: [www.marine.ac.nz/](http://www.marine.ac.nz/)

- Suckers and tentacles
- Fish, fins and fun
- Creature features
- Sharks, Inside and Out
- Seashore scramble
- Marine roadshow
- How big?



**Marine Discovery**  
in the heart of Otago Harbour

LEOTC School Programmes  
Curriculum Linked with Resources  
Early Childhood • Primary • Secondary

UNIVERSITY OF OTAGO  
MARINE STUDIES CENTRE

### Marine Programmes 2012

Level	Programme	Target Year Levels
Level 2-4	<b>Crustaceans on the rocks: 1913 Pilot Cutter</b> The Scientist, Nelson of Pictou-Maitland Bay Students will get the chance to help out this offshore replica and to learn all wonders of the living world, from the rocks, seashells, sponges, starfish and soft-bodied life. They will also experience scientific discovery for themselves and learning practices, lesson planning, & mentoring students.	Level 2-4 (1-2) Level 2-4 (3-4) Level 2-4 (5-6) Level 2-4 (7-8)
Level 2-5	<b>Maitland Bay Sea shore exploration</b> Open-Climate Special School year 2-5 Through a series of interactive games and hands-on exploration, students learn about the significance and ecological role of Maitland Bay. Through a series of interactive games and hands-on exploration, students learn about the significance and ecological role of Maitland Bay. Through a series of interactive games and hands-on exploration, students learn about the significance and ecological role of Maitland Bay.	Level 2-5 (1-2) Level 2-5 (3-4) Level 2-5 (5-6) Level 2-5 (7-8)
Level 2-4	<b>The Marine Road Show</b> What is the road show all about? Join us for the Marine Road Show for all ages and levels in your classroom. Students learn about marine biodiversity, and will take on the road and discover how animals cope with the water through interactive games.	Level 2-4 (1-2) Level 2-4 (3-4) Level 2-4 (5-6) Level 2-4 (7-8)
Level 2-5	<b>How Big?</b> An exciting new programme exploring the size of organisms and how this relates to their survival. Can the size of an organism be related to its habitat? Try to answer all questions that your class asks. This programme includes a hands-on activity, a quiz, and a challenge for your class.	Level 2-5 (1-2) Level 2-5 (3-4) Level 2-5 (5-6) Level 2-5 (7-8)
Level 2-5	<b>Sharks inside and out</b> Are sharks scary? What do you know about sharks? Find out all about sharks and their lives. This programme includes a hands-on activity, a quiz, and a challenge for your class.	Level 2-5 (1-2) Level 2-5 (3-4) Level 2-5 (5-6) Level 2-5 (7-8)
Level 2-3	<b>Plankton and the ocean treasures</b> Why have you heard of plankton? They make the ocean blue. They are tiny organisms that live in the water. They are the food for many other organisms in the ocean. They are the ocean's treasures.	Level 2-3 (1-2) Level 2-3 (3-4) Level 2-3 (5-6) Level 2-3 (7-8)

## This resource supports NZC Science Level 3/4

**NATURE OF SCIENCE: UNDERSTANDING ABOUT SCIENCE:** Appreciate that science is a way of explaining the world and that science knowledge changes over time.

- **LIVING WORLD: ECOLOGY:** Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human induced.
- **LIVING WORLD: LIFE PROCESSES:** Recognise that there are life processes common to all living things and that these occur in different ways.

## Contact details

The New Zealand Marine Studies Centre, University of Otago, offers marine education programmes and resources for primary and secondary schools in southern New Zealand.

T: 03 479 5826

E: [marine-studies@otago.ac.nz](mailto:marine-studies@otago.ac.nz)

W: [www.marine.ac.nz](http://www.marine.ac.nz)

The Science Learning Hub provides resources for teachers for school years 5-10. It is developed by educators and teachers in collaboration with New Zealand scientists and funded by the Ministry of Science and Innovation (MSI).

T: 0800 023 579

E: [enquiries@sciencelearn.org.nz](mailto:enquiries@sciencelearn.org.nz)

W: [www.sciencelearn.org.nz](http://www.sciencelearn.org.nz)