



Sea Science Student Expo Activity Guide and Worksheet

Welcome to the 2024 Volvo Ocean Lovers Festival. We are very excited to have you joining us for the Sea Science Student Showcase on Thursday, March 21 at the Pavilion, Bondi Beach. Below is a list of activities you can experience on your visit, accompanied by some questions you may wish to try answering whilst with us, or afterwards when back at your school/college.

MAIN PRESENTATION SESSION:

Location: Bondi Pavilion Theatre, Level 1

Session 1 time: 11.00-12.30

Session 2 time: 1.00-2.30

MC: Robin Mellon

Duration: Both 90 minutes

Description: Your chance to hear from the following inspirational speakers on a variety of marine-related subjects.

Speaker 1: Emily Rowland, Ocean Youth Ambassador

Talk title: *Building the Capacity of Youth (12-24) to influence positive action for our ocean.*

Talk description: *Emily talks about her experiences as a young advocate for the ocean, sharing stories from her local journey. She highlights the challenges and encourages everyone to take action to protect the ocean.*

Two questions for you to answer:

Q1: What percentage of the ocean is considered highly protected?

A:

Q2: Define the 'Spillover Effect' in your own words.

A:

Speaker 2: Cay-Leigh Bartnicke, Science Curator, Australian National Maritime Museum

Talk title: *Voice for the Ocean*

Talk description: *What does the ocean's voice sound like? What do you think it would tell us if it knew we were listening? Find out how Cay-Leigh is learning to share stories of the ocean and marine science discoveries as a curator and science communicator working at the Australian National Maritime Museum.*

Two questions for you to answer:

Q1: What are 3 ways science is communicated today?

A:

Q2: What do oyster reefs do for the marine environment?

A:

Speaker 3: Associate Professor Rachael Gray, The University of Sydney

Talk title: *Treating endemic hookworm disease in endangered Australian sea lion pups.*

Talk description: *The Australian sea lion, Neophoca cinerea, is Australia's only endemic pinniped species. The species is listed as endangered with less than 10,000 individuals across its range. Like many marine mammals, this species faces a number of threats, including infection of pups with the intestinal worm, hookworm (Uncinaria stenocephala). Hookworm infection results in clinical disease and can cause pup death. This presentation will describe a minimally invasive treatment to eliminate hookworm infection in free-ranging Australian sea lions in South Australia including a discussion of the potential benefits, and disadvantages, of treatment intervention.*

Four questions for you to answer:

Q1: How is hookworm infection diagnosed in Australian sea lion pups?

A:

Q2: What symptoms do pups with hookworm infection have?

A:

Q3: What treatment has been used to successfully eliminate hookworm infection in Australian sea lion pups, and why is it considered minimally invasive?

A:

Q4: Discuss the benefits of treating hookworm infection in Australian sea lion pups.

A:

Speaker 4: Megan (Meg) Trethewy – Research Assistant: Project Restore, Sydney Institute of Marine Science

Talk title: *Project Restore: Insights from a Research Assistant*

Talk description: *Students will immerse themselves in the world of ecosystem restoration with Meg, a Project Restore Research Assistant. This session will provide insight into a first of its kind project that focuses on restoring more than one habitat at a time. Meg is out in the field day to day and is an expert on Living Seawalls and the critters that call these home. Following this session students will be equipped with new learnings around a number of restoration methods and the species that these restoration activities aim to help thrive!*

Two questions for you to answer:

Q1: What are the four elements of Project Restore?

A:

Q2: Briefly describe what seascape connectivity means?

A:

Speaker 5: Laura Simmons Displays Curator at SEA LIFE Sydney Aquarium

Talk title: *Not just fun and displays, Aquariums are saving some of the world's most endangered aquatic species.*

Talk description: *At SEA LIFE Aquariums in Australia and New Zealand live many rare, unique, and endemic aquatic species, but they are not just for show, they are there to help save wild populations from extinction. Through breeding, rescue/rehab, research and recovery programs, animals in aquariums are crucial to the conservation and survival of our most amazing underwater wildlife like corals, freshwater fishes, seahorses and sharks.*

Three questions for you to answer:

Q1: What is the difference between ex situ and in situ?

A:

Q2: What does "endemic" mean?

A:

Q3: What is an "insurance population?"

A:

Speaker 6: Amy Smoothery, SharkSmart, NSW Department of Primary Industries

Talk title: *The tooth about Sydney's sharks*

Talk description: *New South Wales scientists from the Department of Primary Industries are leading one of the largest shark tagging and tracking programs in the world. Dr Amy Smoothery will present research on the movement and behaviours of bull sharks in Sydney Harbour and surrounding areas for students to gain an understanding of when and where they occur.*

Five questions for you to answer:

Q1: How many bull sharks have NSW DPI tagged in Sydney Harbour

A:

Q2: And what is the size range of these sharks?

A:

Q3: What time of year are there more bull sharks in Sydney Harbour and surrounding areas?

A:

Q4: What is the preferred water temperature of bull sharks in Sydney Harbour?

A:

Q5: Where have bull sharks been tracked during winter and spring?

A:

DISPLAYS and EXHIBITIONS

There are a myriad of displays and art exhibitions that accompany the Sea Science Student Expo. Feel free to visit these ahead of and/or after your theatre presentation slot.

Seabirds to Seascapes: Project Restore

Location: Front of Bondi Pavilion (Beachside)

Display description: *The largest harbour restoration project in the world just happens to be on our doorstep, in the iconic Sydney Harbour. The projects focus, to rewild and restore marine habitats for penguins, seals, seahorses and turtles.*

Two questions for you to answer:

Q1: If you spot a seal on land, by law, how many metres must you stay away from the seal and why is this important?

A:

Q2: Why are seagrass meadows so important?

A:

The University of Sydney Display Area

Location: High Tide Room off the inner courtyard of the Bondi Pavilion

USYD display 1: Coral structures in One Tree Reef:

Description: Many people know that coral supports a reef's ecosystem by providing a living habitat for fish and other sea life. However, did you know that coral continues to play a vital role in the reef even thousands of years after it lived? At the University of Sydney's One Tree Island Research Station, we study how both recent and ancient coral skeletons affect the reef. By studying sand cores, we can see how the coral in the reef have changed over thousands of years and use this to predict how current coral will react to future changes in climate.

Q1: How do marine scientists use sand cores to predict future changes to reef ecosystems?

A:

USYD display 2: Wave dynamics around One Tree Island

Description: The University of Sydney's One Tree Island isn't special just because it is the only island licensed for research and teaching in the Great Barrier Reef. No, it turns out that unlike most islands, One Tree is also made entirely by waves! We built our wave tank specifically show how this phenomenon occurs, so come have go and see how physics and biology interact to continuously build and destroy structures in our oceans.

Q2: Why is it important to understand wave morphodynamics when studying coral reefs?

A:

USYD display 3: Sea Lions VS Hookworms

Description: All Australian sea lion pups contract hookworm through their mother's milk. Unfortunately, however, many pups do not survive the damage done by these intestinal parasites. With population numbers dwindling, it is more important than ever to help sea lion pups fight off hookworm infections. Professor Rachael Gray and her team from the University of Sydney have been conducting trials using Ivermectin to kill hookworm and allow the pups to recover. Ivermectin is a readily available, topical medicine that has been successfully used to kill hookworm in other species. Have a go at the activities in this display to build your understanding of the work being done by Rachael and her team to increase Australian sea lion populations.

Q3: On average, how many hookworms can be found in an Australian sea lion pup?

A:

Australian National Maritime Museum Waste Plastic Extruder

Location: High Tide Room

Display description: *Join the ANMM and see how plastic can be recycled into a carabiner using a plastic extruder! Students will learn about different types of plastic and also learn about why it is important not to burn plastic.*

One question for you to answer:

Q1: *What is plastic made of?*

A:

SEA LIFE Display Area

Location: Inner courtyard of the Bondi Pavilion

Display description: *Artefacts*

Out of Sight, Out of Mind, by Underwater Earth

Location: High Tide Room of the inner courtyard of the Bondi Pavilion

Exhibition description: *Come and virtually experience what there is to admire, love and protect about the ocean. Underwater Earth's interactive exhibition showcases some of their 360-degree underwater images from across the globe. Don't forget to bring and use your mobile phone, if allowed.*

Two questions for you to answer:

Q1: What was the name of Underwater Earth's special camera system used for both science and underwater Google Street View?

A:

Q2: How do researchers identify different manta rays?

A:

'Litterarty' Waste-Art Competition Exhibition

Location: Yalagang Room off the inner courtyard of the Bondi Pavilion

Exhibition description: Come and see the finalists of the 'Litterarty' Waste-Art Competition on display. Artworks have been constructed from collected rubbish that has been repurposed into an art medium of the students choosing, including sculpture, 2D, assemblage, mixed media, and collage.

Ocean Sentinels by the Museum of Underwater Art

Location: Walk-through area near the Pavilion Gallery

Exhibition description: *The Museum of Underwater Art (MOUA) Ocean Sentinels sculptures honour famous marine scientists and conservationists such as Sir Maurice Yonge (first explored the Great Barrier Reef) and Prof Charlie Veron (single-handedly mapped 20% of all the worlds corals). These sculptures, each telling a unique story, epitomise the MOUA's commitment to preserving the ocean's delicate balance.*

Tidal Traces by Nick Wilkinson and Claudia Leonard

Location: Level 1 of the Bondi Pavilion

Exhibition description: *Welcome to Tidal Traces. You've heard of generative AI but have you heard of generative action? This involves the physical behaviours that promote the well-being of future generations. Tidal Traces explores the art between AI and what's left of our natural world. Our hope, through this immersive installation, projection and sculpture is to both inspire and move you to leave our future generations with a world as beautiful as we've captured here.*

Beach Couture: Haut Mess by Marina DeBris (artist)

Location: Entrance of the Bondi Pavilion

Exhibition description: *Plastic pollution has become ubiquitous in our ocean and on our shores. Beach Couture: A Haute Mess, is a collection of wearable pieces made from trash collected from the beaches and oceans. It makes visible, in grotesquely amusing fashion, what is often overlooked - but shouldn't be. Ideally, viewers will be provoked to take some action in their everyday use of plastic items.*