



# SEA SCHOOL

## MISSION STATEMENT

Sea School will provide sustainability and marine conservation education for students of all ages. This is an at-sea and on-shore experience and education that will connect students more closely with their coastal environment.

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## SEA SCHOOL PROGRAMS

Program content is highly flexible and adaptable for groups of students ranging from Kindergarten to Grade 12. Programs may range from 2 hours to 2 full days. Trips can be tailored to provide a west coast experience for visiting exchange groups such as sports teams, bands or international students.

Sea School believes the best class activities are a result of collaboration between the teacher and the resource people. Sea School instructors are available for assistance in pre-trip class research and readings. We can also provide digital photos for your group to use for post-trip activities such as newsletters or presentations.

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## SEA SCHOOL PROGRAM PRICES

- Marine Education Centre experience only (1.5 hrs)  
\$10.00 + GST per student (max. 30 students)
- Marine Education Centre & Boat Program (2.5 hrs)  
\$20.00 + GST per student (min. 30 students, max 80 students)
- 1/2 Day Boat Program (includes stops) (3 hrs)  
\$20.00 + GST per student (min. 30 students, max 80 students)
- Full Day Boat Program (includes stops) (6 hrs)  
\$30.00 + GST per student (min. 30 students, max 80 students)
- Full Day Jubilee/Boat Program (8 hrs)  
\$40.00 + GST per student (min. 30 students, max 80 students)
- 2 Day—1Night Camp Jubilee/Boat Program (includes meals & accommodation)  
\$99.00 + GST (min. 30 students, max 80 students)
- Longer experiences can be arranged to meet your group's needs



**Following are some lesson ideas to illustrate the diverse and exciting subject material and activities possible with Sea School.**

## NATURAL HISTORY & GEOGRAPHY OF INDIAN ARM AND PORT MOODY



Explore the waters and islands of Indian Arm by boat and learn about the natural history of both marine and terrestrial wildlife. Practice plant and bird identification. Discuss traditional plant uses, human impacts, invasive species and habitat loss.

- Boat tour of Indian Arm & walk at Indian River / Granite Falls estuary / Twin Islands
- Wildlife viewing, creating a species list including harbour seals, eagles, shorebirds, sea birds, etc
- Estuarine ecology
- Juvenile fish habitat—eelgrass nurseries
- Landforms of Indian Arm—glacial erosion, glacial sill, waterfalls, southernmost fiord on the western coast of North America
- Micro-climates and their effect on species distribution



## MARINE BIOLOGY AT SEA

Learn on-board observation and sampling techniques used by oceanographers and marine biologists. Become familiar with the lifecycles of native species including seals, salmon and jellyfish. Discuss factors affecting species distribution including ocean currents, water salinity and temperature. Consider the effects of pollution on local species and the bio-accumulation of harmful substances. Use the local crab fishery to understand conservation regulations and why some species are at risk.

- Boat tour of Indian Arm, Port Moody Arm
- Plankton netting and identification
- Harbour seal behaviour and scientific method
- Jellyfish in viewing chambers
- Food web and trophic levels—microscopic phytoplankton, zooplankton and associated wildlife
- Physical oceanography (waves, currents, temperatures, salinity, density)
- Fish and the status of Georgia Strait fisheries (salmon, lingcod, crab, shrimp and shellfish)
- Issues and questions related to local marine life



## HARBOUR ISSUES

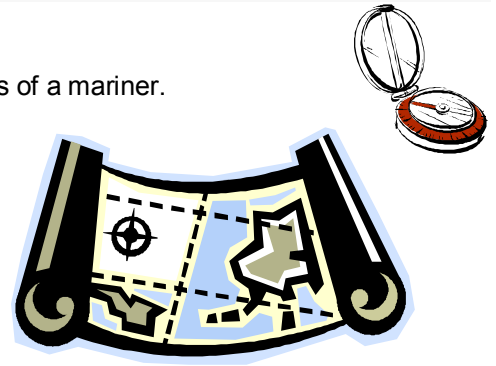
See Port Moody / Vancouver Harbour from a water perspective and learn about how the port functions. Examine issues affecting humans and the environment.

- Boat exploration of various harbour facilities—ships in port, Pacific Coast Terminals sulfur loading facility, Burrard Thermal Generating Station, Flavelle Cedar Mill (the last tidewater mill in Vancouver Harbour)
- On-site discussion of “What makes an issue?”
- Ecological footprint of human population in GVRD
- Pollution of air, water, beach
- Sewage treatment / storm-water / run-off
- Power generation (Burrard Thermal, Buntzen Generating Stns)
- Pleasure boating / commercial traffic—antifouling paints, noise above and below water, bilge water discharge, introduction of invasive species
- Habitat loss—seawalls / lost mudflats / altered shore-lines
- Enhancement projects—Purple Martin nesting boxes, osprey platforms, salmon habitat restorations
- Commodities shipped through the port (sulfur, grain, sugar)

## AT SEA...WEATHER, NAVIGATION AND SEAMANSHIP

Stand a watch at sea while voyaging the length of Indian Arm and learn the skills of a mariner.

- Nautical terms
- Knot tying / splicing / decorative work
- Weather forecasting / front and cloud types / weather patterns
- Reading a nautical chart—symbols, latitude/longitude, distance calculations
- Piloting using a chart and compass
- Introduction to celestial navigation



## HISTORY OF INDIAN ARM AND THE WORKING HARBOUR

Tour Burrard Inlet and Indian Arm by boat and learn the pre/post colonial history of the area from a marine perspective. Visit sites such as:

- ⇒ Bunzten hydro generating stations
- ⇒ Tsleil-Waututh First Nations pictographs
- ⇒ Historical settlements—Thwayte's Landing, Buntzen Bay, Wigwam Inn
- ⇒ Reed Point Marina—BC's largest marina
- ⇒ Flavelle Cedar Mill—last tidewater mill in Vancouver Harbour
- ⇒ Pacific Coast Terminals—sulfur, styrene, bulk chemicals loaded

- Making cedar bracelets
- Settlement patterns
- Railway terminus
- Resource industries of Indian Arm & the Lower Mainland
- Allocation of First Nations reserves



## MARINE INVERTEBRATES OF THE INTERTIDAL ZONE



Travel up Indian Arm by boat and then explore the beach at Granite Falls / Orломah Beach. Understand zonation due to species interaction and abiotic factors. Learn how to identify and record dozens of invertebrate species.

- Beach transect survey
- Quadrant survey
- Invertebrate identification and drawing
- Species adaptations
- Keystone species

## ART AT SEA

Experience and capture the wild coastal beauty of the inlet. Follow in the footsteps of artists such as Emily Carr, Jack Shadbolt, Tony Onley and Anthony Goldsworthy and explore their interpretations of the natural world. Engage in discussion about the art of local First Nations people and consider famous First Nations artists such as Bill Reid, Roy Henry Vickers and Robert Davidson. Practice techniques for doing art outdoors in all types of weather.

- Printmaking
- Found object sculpture
- Oil pastels
- Pencil and charcoal drawings
- Photography
- Scientific illustration

## LANGUAGE ARTS AT SEA—A SOURCE OF INSPIRATION

Tour Indian Arm / Vancouver Harbour and consider why many great writers have found inspiration in the sea. Write and share poetry and prose. Read selected passages and discuss famous literary writing about the sea. Examine the language of the sea and gain insight into the origin of many commonplace expressions.

- Boat tour of Indian Arm / Vancouver Harbour—stop and experience the sounds, smells, movement of the working harbour and its wild side
- Poetry free-write and read aloud
- Journaling
- Nautical terms
- Themes of classic sea poems
- Sea shanties

“About, about in reel and rout  
The death-fires danced at night;  
The water, like a witch's oils,  
Burnt green, and blue and white.”

*from The Rhyme of the Ancient Mariner  
by Samuel Taylor Coleridge*

Sea School is a partnership between:

- Marine Education Centre—a floating lab at BC's largest marina, Reed Point in Port Moody
- Camp Jubilee—a retreat, conference and educational facility on Indian Arm with a marine outpost including, “OceanWatch” (40 ft Transport Canada certified power vessel for up to 40 passengers), kayaks, canoes, wilderness trails & overnight accommodations for up to 150 people.
- Shearwater Education—a marine based, sustainability education organization with “Grey Selkie” (40ft Transport Canada certified power vessel for up to 40 passengers)

For more information or to book a SEA SCHOOL experience,

call 604-937-7388

or visit [www.campjubilee.ca](http://www.campjubilee.ca)

## INSTRUCTORS & RESOURCE PEOPLE

- **Rod MacVicar**—Captain, Director of Marine Education Centre and marine educator  
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- **Ruth Foster**—Environmental educator  
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- **Mitch Bloomfield**—Captain and co-director of Camp Jubilee Retreat & Conference Centre  
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- **Dave Duckworth**—Outdoor educator and Co-director of Camp Jubilee Retreat & Conference Centre  
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- **Ian Giles**—Captain, environmental educator and Director of Shearwater Education Ltd.  
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