



Teacher Information and Guidelines

Tidepool Expedition

Pre-Visit Checklist

- **Please review the invoice.** Note the deposit due date; your deposit must be received by that date in order to hold your reservations. A purchase order will be accepted in lieu of a deposit.
- **Make sure you understand the cancellation policy.**
- **Make sure program balance is paid.**
- **Arrange for chaperones.** MSI requires the assistance of **one adult per ten students.** These adults will assist the students in each group. They do not need to have a science background, but they should be enthusiastic and interested.
- **Complete and return the Student Assessment Sheet.** Fax, email, or mail the Student Assessment Form a few days prior to your voyage.
- **Create list of student groups.** Divide your students into groups. Two groups for 1-30 students, three groups for 31-45 students, four groups for 46-60 students, and five groups for 61-75 students.
- **Notify MSI if there are any special needs** (e.g. students in wheelchairs or crutches).
- **Use pre-activities and background information.** This helps prepare your students for the voyage and can be found on the MSI website: www.sfbaymsi.org.
- **Arrange transportation.** Book buses or arrange for carpools. We recommend booking buses as early as possible to ensure they are available for the times that you need them.

Day-of Visit Checklist

- **Arrive 20 minutes prior to the start of your program.** This allows time to use the restrooms and have a snack before your program begins. The tidepools are approximately a 20 minute walk from the parking lot, so all students are encouraged to use the portable bathrooms on site before the program begins.
- **Dress in layers.** Students will be exploring the tidepools on the coast, and although we discourage getting wet it sometimes does happen. The coast is often colder than inland areas, so please encourage students to wear layers. If the forecast calls for rain, please have students bring rain gear.
- **For safety reasons, close toed shoes are mandatory.** Because of the rocky terrain of the tidepools, closed toed shoes are required. Rain boots are recommended.
- **Make sure driver(s) have directions to Pillar Point.** You will find directions to the tidepool parking lot on our website at: www.sfbaymsi.org.
- **Bring snacks and lunches if you plan on eating on site.** If you would like a snack break during your program, please notify the instructional staff at the start of the program so that they can add it to the schedule.

- **Bring a trash bag.** There are trash cans in the parking lot, but Pillar Point does not have any trash receptacles near the beach. If you plan on eating lunch on the beach, please have students pack their own trash, or bring a trash bag to bring trash back to the parking lot.

Post-Visit Checklist

- **Send in Thank You to Sponsors to MSI.** If artwork is involved this also enters the students into MSI's Translating the Tides Competition. See below for more details.
- **Use post-activities.** This helps solidify your students' grasp of knowledge they gained on the voyage and can be found on the MSI website www.sfbaymsi.org.
- **Make sure program balance is paid.**
- **Book for next year.** We take bookings a year in advance, so book early if you want specific times of year or dates.

Program Logistics

Location Considerations

Parking is fairly limited (especially on sunny days). It is best to travel by bus or to carpool. There is one pit toilet and two portable toilets located at the end of the parking lot. Please advise your students that there are no restroom facilities once we walk out to the tidepool area. There are trash cans in the parking lot, but Pillar Point does not have any trash receptacles near the beach. Because of the exposed coastal location, Pillar Point is often colder and breezier than much of the Bay Area.

Program Length and Student Participation

This program is two and a half hours long and is for grades 3 and up. The Tidepool program can accommodate up to 75 students, who will be split into smaller learning groups in order to work more closely with the instructors. Please divide your students into smaller groups prior to your arrival. Two groups for 1-30 students, three groups for 31-45 students, four groups for 46-60 students, and five groups for 61-75 students. Think about cooperative working groups and learning levels when dividing your class. Please have your students wear name tags for this program.

Weather and Clothing Considerations

Students will be working as scientists in the field. They should wear clothing and closed-toed shoes that they do not mind getting wet, and should bring an extra pair of shoes and socks for the ride home. Rain boots are highly recommended. If the forecast calls for rain, please have students bring rain gear - we will go tidepooling rain or shine. Even if it is warm and sunny in most of the Bay Area, it is often cool and cloudy on the coast. Layered clothing, windbreaker, hat, and sunscreen are recommended.

Snack and Lunch

If you would like a snack break either before or during your program, please notify the instructional staff at the start of the program so that they can add it to the schedule. There are trash cans in the parking lot, but Pillar Point does not have any trash receptacles near the beach. If you plan on eating lunch on the beach, please have students pack their own trash, or bring a trash bag to bring trash back to the parking lot.

Sponsor Acknowledgement and Translating the Tides

Translating the Tides is a creative contest run by the Marine Science Institute (MSI) for students in grades kindergarten through college who participate in MSI's hands-on marine science education programs. Translating the Tides is a wonderful opportunity for students to express, in their own voices and styles, what they have learned and what they want others to know about our aquatic environments. All submissions count as sponsor acknowledgement. Winning entries are selected and may be published on the MSI web site, in our newsletter BayLines, on our monthly desktop calendar and other promotional materials.

Role of Assisting Adults

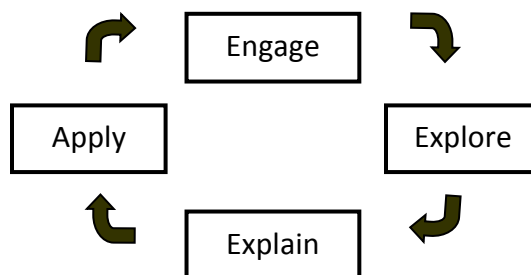
For safety reasons, we require the participation of one adult per group of students. It is most helpful if the assisting adults/chaperones help monitor safety and keep all of the students together in a group with their instructor. Our method of teaching is to ask thought-provoking questions that will lead students to their own answers. We ask that adults do not provide answers to the students, but help them to discover the answers on their own. All adults will be briefed by our instructors at the beginning of the program.

Student Assessment and Learning Cycle

Since 1970, MSI has tailored science activities to meet the needs of teachers' curriculum. Students and teachers present themselves to our programs with a wide range of interdisciplinary science understandings and skills. Our marine science educators are specially trained to teach all ages with interesting and innovative methods that encourage interaction and problem solving. We encourage you to tailor your program by telling us about a particular theme that your class has been studying. Please fill out the Student Assessment Sheet you received to let us know.

MSI has modified our working educational philosophy to respond to this broad range and to help teachers and students get the most from our programs. What you do before, during, and after the day of the program will determine to a very large extent how strong a partner MSI will be in helping you meet your learning objectives. As you plan a visit to MSI, please consider how this opportunity fits within your overall instructional objective. What learning outcomes do you desire from this experience? How well is the class positioned to move your desired outcomes toward a reality? Please use the following description of the learning cycle to assess your students.

The Learning Cycle Model



Engage – Students are just beginning to generate interest in marine science.

“The MSI program will be the hook from which I launch my unit and introduce my class to the excitement of marine science. I’m willing to come into this trip a bit cold...my main objective is to generate curiosity and get the students raising questions.”

Explore – Students are ready to actively experience, form predictions, and make observations.

“My students are already hooked on marine science. I’m bringing them to the MSI program with basic understandings and tools... They know a bit about the Bay and are ready to actively explore it. My objectives are for my students to make observations and to collect and record data. I’d like to see them make informed predictions and to begin framing their own critical questions.”

Explain – Students have been developing understanding for some time, and are now ready to speak the language of marine science.

“By the time we participate in our MSI program my students will have conducted serious investigations of topics related to the San Francisco Bay. My objective is to see them using the language of marine science... I’d like them to begin exploring important concepts and to comprehend and analyze other explanations.”

Apply – Students have a mature understanding of marine science, perhaps including aspects that are far afield from the San Francisco Bay area, and now are ready to relate that knowledge to their own backyard.

“My group has a good handle on the major learning objectives I have set for marine science. MSI’s program is going to provide new scenarios for them to consider and address. My objective is to see my students using and applying their new knowledge in a different context.”

Tidepool Expedition Program Description

When you arrive at the Pillar Point parking lot, your class will be greeted by an MSI instructor. After the students have a chance to use the restrooms in the parking lot, the Tidepool Expedition begins with a 10-15 minute walk to the beach. Students will receive an introduction to the program where they learn about the rocky intertidal habitat, what tides are, and how animals are specially adapted to live there. Your group will then divide into two to five groups (dependent on the amount of students) with an instructor. Under the guidance and supervision of MSI instructors, students will explore the tidepools in search of live animals such as fish, arthropods, mollusks, cnidarians, and echinoderms. Students will closely observe and analyze these animals in their natural habitat, and can expect to handle and touch a variety of organisms. After exploring the tidepools, all groups will converge back onto the beach for a closing activity.

Program Objectives

1. To provide an exciting educational experience that shows students how marine biologists study in the field.
2. To introduce students to the intertidal environment and identify the stresses of life in the different intertidal zones.
3. To relate physical and behavioral adaptations of marine animals to their environment.
4. To emphasize how the tidepool organisms are interconnected in the marine food web.
5. To gain an understanding, appreciation, and respect for marine ecosystems, and understand the special responsibilities of humans in the natural world.

Arrival Times

Please arrive 20 minutes prior to the start of your program to allow time to use the restrooms and have a snack before your program begins.

Tidepool and Safety Rules

Every year the coast is visited by millions of people, and our presence can have an impact on this vulnerable environment. We try to lessen our impact while keeping program participants safe by following these rules:

- **Always walk**, and do not jump between rocks or into the tidepools. The rocky intertidal can be slippery, and caution is needed when navigating around the pools.
- **Always stay behind your instructor.** Your MSI instructor knows the safest paths to explore the tidepools. Follow their path and stay close to the instructor.
- **Never face your back towards the ocean.** Keep an eye on the tide as it may come in quickly.
- **Watch where you walk** and step cautiously. Many organisms are very well camouflaged, and it can be easy to step on them.
- **Put animals back where they were found.** When searching for animals, replace any seaweed or anything else covering the animals. Only instructors should turn over large rocks. They will replace the rocks in the same manner that they were found to prevent exposure of the underside to the sun or other elements.
- **Avoid disturbing ecological areas** that may be more sensitive to disturbances.
- **No collecting.** Take only trash from the tidepool and beach area. It is illegal to collect animals without a permit.

Inspiring respect and stewardship for the marine environment through experiential learning

Program Format - Station Overview

Introduction:

Students will receive an introduction to the program where they learn about the characteristics of the rocky intertidal habitat, what tides are, how tidepools are formed, and how animals are specially adapted to live there. They will talk about the different stresses on the animals that live in the tidepools, and which animals they may see during the exploration. Responsible tidepool practices and safety rules will be discussed. At the same time, a second instructor will brief the adults on their role in the program. When the introduction is over, your group will divide into two to five groups (dependent on the amount of students) with an instructor.

Tidepool Exploration:

The exploration will likely begin at the lowest exposed tidal zone and continue toward the beach, depending on tidal conditions. Students will explore the different rocky intertidal zones, noticing how the zones vary while observing organisms in their natural setting. Each group will be supplied with a field guide, dip net, and bucket to allow for closer examination of animals. All animals will be replaced where they were found once the group has finished their observations. During the exploration, instructors will discuss the characteristics of the tidal zones as well as the different adaptations the animals have acquired for living in this environment. Older students will also focus on distinguishing traits of the major phyla while identifying animals from each phylum.

Closing:

The closing activity may take place either as a large group or in the smaller working groups (depending on the amount of students). An instructor will briefly review the animals that were found, the tidal zones in which they live, adaptations of the animals, etc. Then, depending on the age of the students, the instructor may choose to do the “Trash Timeline” activity, which focuses on how long different items take to decompose in the ocean. The group will discuss how humans impact the marine environment and solutions for affecting change. The program generally ends with a beach clean-up as we walk back to the parking lot.

Optional Activity:

Students in 4th grade and up may be interested in participating in taking scientific data with the use of transects. Transects enable scientists to estimate the population of organisms in a given area and keep track of changes over any length of time. Please let the instructional staff know if you are interested in participating in this activity.