

Teacher Information and Guidelines

Wonders of Watersheds

Inland Voyage (in school) 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 students have taken pre-surveys**
- **Make sure program balance is paid.**
- **Complete and return the Student Assessment Sheet.** Fax, email, or mail the Student Assessment Form a few days prior to your voyage.
- **Complete and return the Inland Voyage Parking and Set-up Form.** Fax, email, or mail the Inland Voyage Parking and Set-up Form a few days prior to your voyage.
- **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 visit and can be found on the MSI website www.sfbaymsi.org

Inland Voyage (in school) Day-of Visit Checklist

- **School office is aware of where MSI will be setting up and the room/space is available.**
- **Give MSI staff filled out pre-surveys when they arrive.**

Creek Study 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 a minimum of one adult
- **Complete and return the Student Assessment Sheet.** Fax, email, or mail the Student Assessment Form a few days prior to your canoe trip.
- **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.

Creek Study Day-of Visit Checklist

- **Arrive 20 minutes prior to the program.** This allows for time to check-in and use the bathroom.
- **Dress in layers.** Students will be exploring the creek so their clothes may get wet and dirty. If the forecast calls for rain, please have your students bring rain gear.
- **Make sure driver(s) have directions to the park.** You will find directions to Stulstaff Park on our website at: www.sfbaymsi.org If you will be traveling via carpool to Redwood City, please make sure parent drivers know to park on or around Goodwin Ave.
- **Bring non crumbly Snack**

Canoes 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 a minimum of one adult
- **Complete and return the Student Assessment Sheet.** Fax, email, or mail the Student Assessment Form a few days prior to your canoe trip.
- **Create list of canoe groups.** Fill out Canoe Assignment form with 3 participants per canoe (includes adults)
- **Notify MSI if there are any special needs** (e.g. students in wheelchairs or crutches).
- **Fill out the manifest (emergency phone list)** include both student and adult names and numbers on the form.
- **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.

Canoes Day-of Visit Checklist

- **Arrive 15 minutes prior to departure.** This allows for time to check-in and use the bathroom.
- **Bring 2 copies of your updated manifest (emergency phone list) on the day of your program.** Include both student and adult names and numbers on the form.
- **Bring completed Canoe Assignment Form.**
- **Dress in layers.** Students will be handling canoes so their clothes may get wet and dirty. If the forecast calls for rain, please have your students bring rain gear.
- **For safety reasons closed-toed shoes are mandatory for all passengers.** No open toed shoes will be permitted, including on adults.
- **Make sure driver(s) have directions to the dock.** You will find directions to the Institute on our website at: www.sfbaymsi.org If you will be traveling via carpool to Redwood City, please make sure parent drivers know to park in MSI's dirt lot only, and not in Stanford's lot.
- **Bring non crumbly Snack**

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Post-Visit Checklist

- **Make sure students taken post survey and mail it back to MSI.**
- **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

Inland Voyage (in school):

The Inland Voyage program is delivered to a school, library or camp by an MSI vehicle, a truck or van. We need an area accessible to the vehicle that is large enough to set up a two-station program for up to 30 students. This area can be grassy or paved, and shade is always appreciated. If an indoor space is used, it should be accessible without using stairs, have tables and a non-carpeted floor. If the area is separated from recess activities or any other traffic, the students will be more focused and attentive. Ultimately they will get more out of the experience if these factors are considered.

Creek Study:

The Creek Study is delivered at Stulstaff Park in Redwood City. The area that is used is about a 10 minute walk to the bathrooms. This is a park that has a lot of vegetation and water so mosquitos are a potential issue. Long sleeves and pants can help reduce the risk of bites.

Program Length and Student Participation

Inland Voyage (in school):

Each presentation is 50 minutes in length, and allows one class of up to 30 students to participate at a time. Up to five presentations may be scheduled in a day (schedule allowing). The instructors will give a five to ten minute introduction, and then the class will be divided into two groups. To expedite this transition, we ask that the class be divided in half prior to our arrival. The program will wrap up with a brief five-minute closing discussion. We schedule a ten-minute window between programs, which enables staff to set-up for the next program. Please have your students wear name tags for this program.

Creek Study:

The Creek Study is a two and a half hour program. The program allows a group of up to 60 students, in the 6th grade to university level, to participate. We require at least 1 adult to chaperone.

Canoes:

The Canoes in Sloughs is a five-hour program. The program allows a group of up to 27 participants (including adults), in the 6th grade to university level, to participate. We require at least 1 adult to chaperone. If your group is larger than 27 participants (including adults), you must make arrangements with the MSI staff prior to the trip. A third instructor can be added for an additional fee which allows for up to 37 participants (including adults) to be allowed on the trip.

Weather and Clothing Considerations

Inland Voyage (in school):

If cold or rainy weather is forecasted, please plan on providing an indoor space for the programs.

Creek Study:

Please warn students to wear clothes that are appropriate for a variety of weather conditions. Layered clothing that can be easily removed and put back on is the best to wear. Let students and adults know they should wear old clothing that they won't mind getting wet and muddy.

Sandals, open-toed shoes, or high-heels are not acceptable. Students will need to wear socks to wear the boots that MSI provides. We are outside for the entire program, so sunscreen and sunglasses are recommended. Hats and caps are recommended. If rain is forecasted students may be most comfortable in their own rain gear. For safety reasons umbrellas are not allowed.

Canoes:

The weather on the Estuary can change very quickly from one minute to the next. Please warn students to wear clothes that are appropriate for a variety of weather conditions. Layered clothing that can be easily removed and put back on is the best to wear. Let students and adults know they should wear old clothing that they won't mind getting wet and muddy, because salt water and mud may ruin any good clothing. The participants will be lifting canoes so closed toed shoes are required. **Sandals, open-toed shoes, or high-heels are not acceptable.** We are outside for the entire program, so sunscreen and sunglasses are recommended. Hats and caps are recommended. We are equipped with rain gear on our site, but students may be most comfortable in their own clothing and gear. For safety reasons umbrellas are not allowed.

Snack and Lunch

Inland Voyage (in school):

Because of the short duration of the presentations, there is no time for snack or lunches to be scheduled during the presentation. When scheduling your Inland Voyage program, please schedule around recesses and lunches.

RESTRICTION: For the animal's safety, no hand sanitizer or food near the animals.

Creek Study:

If you would like a snack break it is best to do before or after the program, please notify the instructional staff at the start of the program so that they can add it to the schedule. Staff at Stulstaff Park has sitting areas that are available for groups to use for lunch. The park does not have the facilities to accommodate the trash generated by participating groups, and MSI has a "no trash"

policy. Please bring a plastic garbage bag so you can take any garbage back to your school with you, and encourage your students to bring trash-free lunches.

Canoes:

Snack time will happen after the equipment is set-up and paddle instruction is given. It is best if the snack is separated from the rest of their belongings so it is easy to access. Teachers may supply a **group snack** for their students. MSI also recommends that each student brings a bottle of water. We require non-messy food that is easy to eat and is not crumbly (please **do not** bring chips, crackers, crunchy granola bars, etc.). There is time for lunch during the program while the participants are out on the water in the canoes. MSI has a no trash policy, so please encourage your students to bring “no trash lunches”. MSI does not have the facilities to accommodate all the trash generated by participating students so please bring a garbage bag so you can take any garbage back with you. If needed a garbage bag can be requested from the Institute.

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. For more details see www.sfbaymsi.org/translating-the-tides

Role of Assisting Adults

Inland Voyage (in school):

In order to keep program costs at a minimum, we require the participation of at least one classroom teacher or adult. Each group of students will be working with one instructor and any available adults. At each station, the groups will break into smaller groups to study individual organisms. 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 let them discover the answers on their own.

Creek Study:

In order to keep program costs at a minimum, we require the participation of at least one classroom teacher or adult. Each group of students will be working with one instructor and any available adults. 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 let them discover the answers on their own.

Canoes:

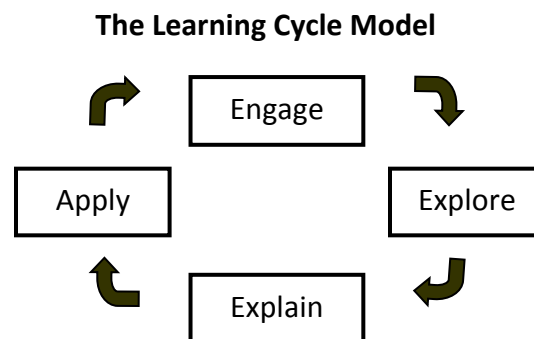
Minimum number of adults is 1 and maximum number of adults depends on how many students are participating since there are a limited amount of spots in the canoes. For safety reasons we require the participation of all adults on the trip. We ask that you choose chaperones who will help motivate and excite the students. The role of the adults will be to

assist in maintaining group continuity and to help keep students on task. Our method of teaching is to ask thought-provoking questions that will lead the students to their own answers. We ask that adults do not provide answers to the students, but let them discover the answers on their own. Adults will also assist with paddling, clean-up, overall group organization and safety.

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.



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.”

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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.”

Wonders of Watersheds Program Description

Explore a local watershed and discover how humans depend on and influence them with the Wonders of Watersheds program. This inquiry-driven multiple-exposure program combines an in-class visit (“Inland Voyage”) with two field trips (“Creek Study” & “Canoes”), which build upon each other to deepen students’ understanding and create opportunities for cross-cutting between concepts. Through this series students gain an in-depth appreciation for what a watershed is and for their connection to the environment.

PROGRAM OBJECTIVES

1. To emphasize how all the living organisms are interconnected in the marine food web, and also how they relate to the physical environment.
2. To gain an understanding, appreciation, and respect for marine ecosystems, and understand the special responsibilities of humans in the natural world.
3. Safe program. Students learn how to paddle and how to be safe on the water.
4. Students gain a basic understanding of marsh ecology (including hydrology, flora, & fauna)
5. Students understand the concept of watersheds.
6. Students identify a local watershed.
7. Students understand that all watersheds in the Bay Area eventually drain to the ocean.
8. Students understand that water quality affects the organisms living in that environment.

ARRIVAL TIMES

Creek Study:

We suggest you plan to be at Stulstaf Park 20 minutes prior the program start time to allow time for using the restroom (a ten minute walk) and checking in.

Canoes:

Most Canoe programs run from 9:00am to 2:00pm. The start time can be adjusted as early as 8:00am. Unfortunately start times can not be any later then 9:00am due to wind conditions in

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the afternoon making it unsafe to be out later. We suggest you plan to be at MSI 15 minutes prior the program start time to allow time for using the shore restroom and checking in.

RESCHEDULING

Canoes:

Canoe programs are dependent on low winds and no lightning. Canoe programs do go out in light rain. Rain gear is available for everyone. Program cancellation will be at the Institute's discretion. If the MSI staff decide the weather conditions have become unsafe while out on the water, the program will continue on land. **Wind greater than 10 mph will cancel a canoe trip** because it causes the canoes to become unstable. Due to the unpredictability of weather conditions around the Bay, we generally will not cancel trips until our staff assesses site conditions the morning of your program (about 45 minutes before the program start). We will contact you as early as possible (at least half an hour before the program start) the morning of your trip if there is a chance of weather cancellation; **please make sure that your home and/or cell phone numbers are correct on your Invoice.** If you need to contact us the morning of your program with questions, you can call (650)364-2760. *If there is a light rain, we will still run the program.* If winds or other factors make canoeing unsafe, you may have the choice of doing a land program that day or to reschedule your canoe trip. Should your program be cancelled by bad weather, MSI will make every effort to reschedule your canoe trip but cannot guarantee that possibility, as reschedule dates are limited. If we are unable to reschedule, MSI will refund the trip in full. Please refer to your invoice for cancellation/refund policies under other circumstances. The Marine Science Institute reserves the right to cancel a trip if participant behavior jeopardizes the safety of the program. We appreciate the assistance of teachers and adult chaperones in this area and have enclosed the program guidelines and expectations to help you prepare your class for the trip. **Please note: If MSI cancels your program because of poor behavior, we will charge you the same amount as a full program.**

PROGRAM FORMAT

Inland Voyage (in school):

The Watershed Inland Voyage program format involves a 10 minute introduction to watersheds followed by a hands-on experimentation with a watershed model. The class is divided into two groups so that students have more access to the activities. The program ends with a closing which reviews the watershed concept and how to prepare for the upcoming field trips.

Creek Study:

During the Creek Study program students take data about the Arroyo Ojo de Agua tributary of Redwood Creek including physical and chemical properties of the water. Using this information they consider factors relating to sustainability and discuss the health of the local watershed. The students start off with a review of the watershed concept. They are then broken into smaller groups and assigned an instructor. In their small groups they will conduct various water quality tests on Arroyo Ojo de Agua. After completing the water quality tests in the creek they will participate in a trash pickup, which will be followed up by a trash analysis and discussion of human impact.

Canoes:

Overview

The Canoes in Sloughs program format involves two land portions and an on the water portion. The first land portion includes an introduction, a gear grab, and instruction on paddling techniques. The water portion includes a sense of place activity, 2 stations, and lunch. There are four options for on the water stations. The stations are chosen by the staff based on the theme selected and the tides. The second land portion includes clean-up and a closing. The closing activity helps students apply all the new information they have learned. Throughout the program MSI instructors and adults will provide guidance and encouragement.

Introduction:

Students will be briefed on safety procedures and some facts about the San Francisco Bay Estuary. The theme for the day will be introduced (please read and return the student assessment form), and the students will be asked to think about why the Estuary is vitally important to the fish and wildlife in the area. Also discussed is our location, the program format, and the boat layout.

Sense of Place:

Students use senses to describe surroundings. They are led through various activities that have them use their senses to contrast natural to manmade within the local environment.

Stations: (2 stations will be selected by instructional staff for program)

Water Quality Monitoring Station:

Students study the water using real hands-on testing and chemistry. This station may include a study of pH, dissolved oxygen, nutrients, and other factors that indicate the health of the ecosystem.

Plant Identification Station:

Using identification sheets, students independently explore the sloughs to identify the flora of this unique ecosystem. They learn about the adaptations that allow plants to survive and even shape their environment, and they compare the roles of non-native and native plants

Mud and Invertebrates Station:

Students use various tools to explore the rich bay mud. Students will collect various invertebrate specimens and use identification sheets to learn more about the invertebrates in the bay and their role in the ecosystem. Students will study the different adaptations that have helped the invertebrates survive in the mudflat habitat.

Trash Collection Station:

Students experience first-hand some of the human impacts on the bay as they remove trash from the protected wetland. They analyze their efforts by taking data on the type and amount of trash that they collect.

Closing:

This time will be spent connecting the stations and defining the students' own role in the ecosystem. This can be done in a variety of ways, and depends on your choice of theme. Students will brainstorm on ideas for how to keep the Estuary healthy, clean, and protected.

*Snack time is available before launching the canoes. All of the students must have a snack with them. We encourage non-messy food that is easy to eat and is not crumbly.

Possible Timeline

9:00 – 9:30 Introduction

9:30 – 9:50 Get Gear (canoes, lifejackets, and paddles)

9:50-10:05 Canoe Groups & Paddling Demo

10:05-10:15 Bathroom Break

10:15-10:45 Safety Talk & Launch

10:45-1:00 On Water (Sense of place, 2 stations, lunch)

1:00-1:15 Land – return to shore

1:15-1:45 Put Gear Away

1:45-2:00 Closing