

## WELCOME TO THE WATERSHED SCIENCE OVERNIGHT PROGRAM

We are pleased that you will be joining us for the Watershed Overnight program! We are proud and excited to provide your students with this exciting program series. We have built our At Sea and Surfscience Learning Centers, outfitted *RV Sea Explorer*, and developed this program to assist fourth and fifth grade teachers with meeting the California Content Standards for Science. This integrated-discipline program is designed to bring students in communities throughout Southern California to the Ocean Institute to explore the science of watersheds. Students learn about internal systems, water quality, hydrologic cycle, Earth's water supply, nutrient cycles, biological assessments, soil composition, ecological integrity, and research techniques. Join us for an exploration into watershed science in our labs and out at sea!

Please take a few moments to familiarize yourself with the materials we have included, and share them with other teachers and chaperones that will be joining you. These materials contain important information to prepare you, your chaperones, and your students for your visit. You will also find important forms that must be returned to the Ocean Institute.

If you have any questions about your visit to the Ocean Institute, please do not hesitate to contact our Director of Program Development, Shanette Grieve at 949-496-2274, extension 339. Again, welcome to the Watershed Science series of programs! We're looking forward to your visit.

Sincerely,

Rick Baker  
Vice President of Education



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## A. ADMINISTRATIVE CHECKLIST FOR OVERNIGHT PROGRAMS

This preparation package contains information for the Watershed Lab/Cruise program. Please review the package carefully to ensure that you will be prepared for your program.

### ***Immediately upon receiving this package...***

- Carefully review the Teacher Preparation Package
- Arrange your transportation
- Mail information letter to parents, and make sure to ask for parent chaperones

### ***Two months prior to your trip...***

- Confirm student and adult numbers with the Ocean Institute**
- Arrange for parent chaperones—please limit the number to two adults for every 12 students.
- Copy and distribute the Chaperone and Parent Information Packets. **KEEP THE MEDICAL FORMS AND THE ACKNOWLEDGEMENT OF RISK FORMS SEPARATE!**

### ***One month prior to your trip...***

- Begin student preparation
- Collect signed Acknowledgement of Risk and Waiver and medical forms from each student and adult
- Return the Special Information Form to the OEC Overnight Coordinator**

### ***Two weeks prior to your trip...***

- Mail program payment to the Ocean Institute—**full payment must be received a minimum of 10 days before your program**
- Collect remaining signed Acknowledgement of Risk and Waiver and medical forms from each student and adult
- Divide students into teams

**Note:** We cannot guarantee that changes in numbers of students or adults can be accommodated if requested within two weeks of your program date

### ***One week prior to your trip...***

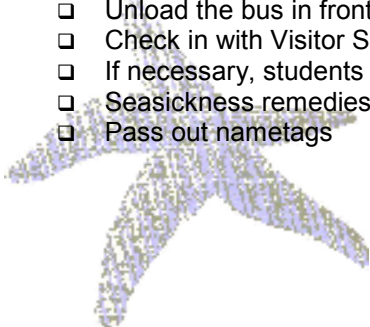
- Review behavioral expectations with students
- Review Student Clothing and Supply List
- Contact the Ocean Institute with any last minute questions or changes

### ***24 hours to go!!!...***

- If inclement weather is expected, contact the Ocean Institute for status of the program
- Make nametags for students and adults
- Complete **R/V Sea Explorer** manifest listing ALL students and adults
- Separate Medical and Acknowledgement of Risk forms

### ***When you arrive for the Sea Floor Explorer Program...***

- Unload the bus in front of the Ocean Institute
- Check in with Visitor Services building with a final head count
- If necessary, students may use the restroom facilities—please limit use to 7 girls and 7 boys at a time
- Seasickness remedies should be taken at least 30 minutes before departure
- Pass out nametags



## B. DESCRIPTION OF LAB/CRUISE PROGRAM

### Watershed Laboratory

Students enter into the At Sea and Surfscience Learning Centers to conduct their research. These experiments are designed to compliment the research completed onboard the *RV Sea Explorer*. Each research team will rotate through all 5 activity stations.

#### Effects of Pollution on the Internal Anatomy of a Living System (Life Sciences)

Students visually examine the external anatomy and dissect a fish to explore the internal anatomy, paying special attention to the digestive process. They also look for evidence of pollution uptake and disease on the fish.

#### Water Chemistry/Quality (Physical Sciences)

Students test a water sample from the Dana Point Harbor and measure temperature, pH, salinity, dissolved oxygen, nitrates, nitrites, and phosphates. They results are used to determine the chemical integrity of the water.

#### Pollutants in a Watershed (Watershed Science)

Students use a watershed model to study the movement and origins of water and pollution within a watershed. Students will use this visual representation to hypothesize the possible effects on the environment, strategies of prevention, and ways to monitor watersheds.

#### Nearshore Biological Assessment (Life Sciences)

Students will learn how a biological survey can be used to assess the conditions of an ecosystem. They will formulate a hypothesis for the given tested question as to whether pollution has affected the biological integrity of the represented nearshore ecosystem. Using the laminated sheets and field guides, they will properly identify and count the animals and plants within each of the three tanks. Students will then determine which of the animals is the indicator species.

#### Water Distribution (Earth Sciences)

Students will examine how earth's water supply is distributed i.e. in oceans, icecaps, lakes, rivers, etc. Then, they will discover how little is suitable for human use, and how their watershed and community receives its supply of freshwater.

### Dana Point Harbor Soil Survey

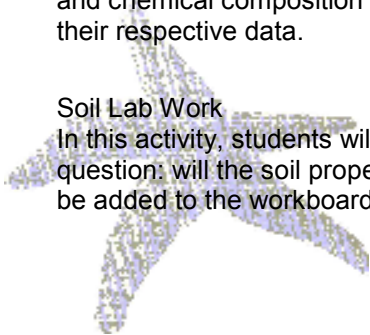
Students enter the field for an examination of the Dana Point Harbor. The students are separated into research teams, with each team focusing on a specific sampling site. The activity explores current soil structure, composition, and conditions within the harbor area. Students will see how changes in natural vegetation and soil may alter the physical, chemical, and biological properties of a location.

#### Soil Field Research

Each research team will visit their sampling site within the Dana Point Harbor. They will conduct site observations, record measurements, and retrieve soil. The information collected will be added to physical and chemical composition test results in order to assess each site. Each team will compare and contrast their respective data.

#### Soil Lab Work

In this activity, students will complete the final seven experiments and formulate a conclusion to their testable question: will the soil properties at our test site differ from or match the other two test sites? Their data will be added to the workboard and the students will prepare to present their findings.



### **Watershed Cruise**

Students board the *R/V Sea Explorer* as junior scientists for an investigation of the coastal waters off Dana Point. The students are separated into research teams, with each team focusing on specific tests. The program explores current environmental issues through research, analytical thinking, and discussion. As well as, demonstrates how individuals, regardless of where they live, make choices that affect coastal water quality.

#### Offshore Nutrient Levels (Physical Sciences)

A water sampling bottle is used to collect a sample of water from a designated sampling site. The students then analyze the nitrate, nitrite, and phosphate levels. The results are compared with data collected on the previous day.

#### Benthic Habitat Assessment (Life Sciences)

The Ocean Institute staff deploy a benthic sampler to retrieve a mud from the ocean floor. The students remove and identify invertebrate organisms living in the sediment. The results are compared with data collected on the previous day.

#### Plankton Population Study (Life Sciences)

A vertical tow net is used to collect a sample of ocean plankton from a designated sampling site. Using microscopes, students identify both phytoplankton and zooplankton as well as estimate the population sizes of both. The results are compared with data collected on the previous day.

## **C. LINKS TO CALIFORNIA SCIENCE STANDARDS**

### **Grade Four**

#### **Life Sciences**

- 2.a. Students know plants are the primary source of matter and energy entering most food chains.
- 2.b. Students know producers and consumers (herbivores, carnivores, omnivores, decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.
- 2.c. Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.
- 3.a. Students know ecosystems can be characterized by their living and nonliving components.
- 3.b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
- 3.d. Students know that most microorganisms do not cause disease and that many are beneficial.

#### **Investigation and Experimentation**

- 6.a. Students will differentiate observation from inference (interpretation) and know scientist's explanations come partly from what they observe and partly from how they interpret their observations.
- 6.b. Measure and estimate the weight, length, or volume of objects.
- 6.c. Students will formulate and justify predictions based on cause-and-effect relationships.
- 6.d. Students will conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and result.
- 6.e. Students will construct and interpret graphs for measurements.
- 6.f. Students will follow a set of written instructions for a scientific investigation.

### **Grade Five**

#### **Physical Sciences**

- 1.a. Students know that during chemical reactions the atoms in the reactants rearrange to form products with different properties.
- 1.f. Students know differences in chemical and physical properties of substances are used to separate mixtures and identify compounds.

#### **Life Sciences**

- 2.a. Students know many multicellular organisms have specialized structures to support the transport of

materials.

- 2.c. Students know the sequential steps of digestion and the roles of teeth and the mouth, esophagus, stomach, small/large intestine, and colon in the function of the digestive system.
- 2.f. Students know plants use carbon dioxide and energy from sunlight to build molecules of sugar and release oxygen.
- 2.g. Students know plant and animal cells break down sugar to obtain energy, a process resulting in carbon dioxide and water.

### Earth Sciences

- 3.a. Students know most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface.
- 3.d. Students know that the amount of fresh water located in rivers, lakes, and underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing water use.
- 3.e. Students know the origin of the water used by their local communities.

### Investigation and Experimentation

- 6.a. Students will classify objects in accordance with appropriate criteria.
- 6.d. Student will identify the dependent and controlled variables in an investigation.
- 6.e. Students will identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment.
- 6.f. Students will select appropriate tools and make quantitative observations.
- 6.g. Students will record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make a specific conclusion.
- 6.h. Students will draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.

## D. ADMINISTRATIVE PREPARATION FOR DAY PROGRAM

### ADMINISTRATIVE CONTACT

For questions, please contact:

Shanette Grieve, Director of Program Development  
Telephone Number: (949) 496-2274, extension 339  
E-mail: [srillorta@ocean-institute.org](mailto:srillorta@ocean-institute.org)

### INTRODUCTION

Thank you for choosing the Ocean Institute as your field trip destination. We appreciate the time and effort it takes to prepare your students for their program, and we will do everything we can to make their experience as rewarding as possible.

Please make sure that all of the participating teachers have a copy of these teacher materials. The information contained here can help you find answers to your questions, develop your preparation timeline, and prepare both your students and chaperones. This packet also contains directions to the Ocean Institute as well as contact telephone numbers—please call us at any time with any questions you may have about your field trip.

### TEACHER INFORMATION: BEFORE YOUR PROGRAM

You can do several things before you arrive to help make your program run as smoothly as possible:

- Complete the **Program Information Form** and return to the OEC Overnight Program Coordinator. **We must have the accurate number of students attending the program at least one month before your program in order to ensure proper staffing and equipment.** Notify the Ocean Institute staff of students with special health, behavioral, or dietary considerations.

- Review the program goals, station activities, and expected behaviors with the students before you arrive. Complete the classroom activities with your students, and make sure they have a clear understanding of the educational concepts they will explore during the program.
- Spend some time choosing and preparing your parent chaperones. Review the program goals, station activities, and expected student behaviors with them before you arrive. Make sure that they have a clear understanding of their role as a chaperone.

### **VERY IMPORTANT**

- This program accommodates a **maximum of 45 students**. Please split your students into 3 research teams prior to arriving at the Ocean Institute.
- Have a signed Acknowledgement of Risk and Waiver and signed medical forms for each student and chaperone before boarding the bus.
- Have a completed Manifest for the *R/V Sea Explorer*.
- Send program payment to the Ocean Institute at least 10 days before the scheduled date of your field trip.

### **TEACHER INFORMATION: DURING YOUR PROGRAM**

Ocean Institute instructors are all well trained to instruct students of different ages and abilities. You and the chaperones can help the instructors monitor student behavior and safety. There are several things you can do to facilitate the smooth running of your educational program:

- Work cooperatively with Ocean Institute instructors and parent chaperones to manage students during the program.
- Work cooperatively with Ocean Institute instructors and parent chaperones to solve student and chaperone management problems.
- Report any problems to the Ocean Institute staff as soon as possible.

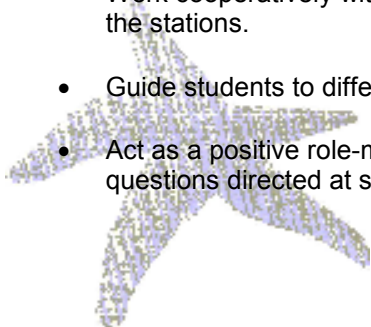
### **TO START THE PROGRAM**

Ocean Institute instructors will greet your students and lead them to the appropriate starting point for your program. They will receive an introduction and then be divided into groups for the duration of the program.

### **CHAPERONE INTRODUCTION AND INFORMATION**

Adult chaperones play a significant role in safety and the educational quality of the program. We request that you bring no more than two adults per 12 students. We ask your chaperones to help us in the following ways:

- Work cooperatively with Ocean Institute instructors and classroom teacher to enforce all safety rules.
- Work cooperatively with Ocean Institute instructors and classroom teacher to keep students on task at the stations.
- Guide students to different stations throughout the program.
- Act as a positive role-model for the students by exhibiting enthusiasm for learning without answering questions directed at students.



**PAYMENT**

**Payment must be received 10 days before your program date.** Please mail a **single check** for the total amount of the program minus the deposit you have already paid. Please make the check payable to **Ocean Institute**.

**FINAL COUNT**

Call the Ocean Institute two days before your program if the number of students or adults changes. When you arrive at the Ocean Institute for your program, you must have an accurate count of total students and adults participating in the program. If the number of participants listed on your Program Agreement is not accurate, call the Ocean Institute immediately. **We cannot guarantee that changes in numbers of students or adults can be accommodated if requested within 2 weeks of your program date.**

**STUDENT AID**

The Ocean Institute maintains a student aid fund for students who are unable to obtain sufficient funding to attend the program. Please call (949) 496-2274, extension 0 for more information and to receive the necessary forms for student aid.

**TRANSPORTATION**

Student transportation should be arranged well in advance. It is important that you arrive on time. Please schedule yourself to arrive at least 15 minutes before your scheduled program start time. If you arrive late, your program time will be shortened.

Buses can unload in front of the Student Services building. After the students have unloaded, the drivers will be notified of where to park the buses.

**FORMS**

The following forms are included in the Information Packets found at the back of this booklet. Please make sure that all of the forms are completed before you arrive for the Watershed Overnight Program. Make sure that you use the forms from this packet—they are the most updated forms.

**Medical Forms**

You will find **medical forms** in the Information Packets. You must have a completed and signed medical form for each student and adult participating in the Sea Floor Explorer Overnight Program. In order for a child to receive any prescription or non-prescription medication during the program, the Administration of Medication form(s) must be completed and signed by the parent or guardian and the child's physician.

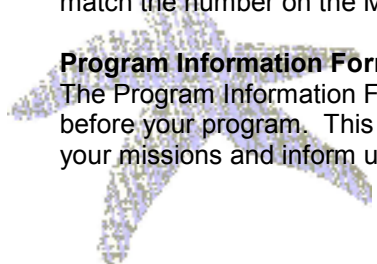
**Acknowledgement of Risk and Waiver** Each student must have this form signed by a parent or guardian to participate in the Watershed Lab/Cruise program. Please make sure that you have one signed form for each student and adult chaperone when you check in with the Ocean Institute staff.

**Manifest for the R/V Sea Explorer**

A Manifest for the *R/V Sea Explorer* must be completed before you arrive for the program. The Coast Guard requires us to have a completed Manifest in order to account for all passengers before we leave the dock. Please have it completed before you arrive at the Ocean Institute—we will lose valuable instructional time if the Manifest must be completed when you arrive. It is important that the Manifest is accurate and includes the first and last names of ALL students, teachers, and chaperones. Your Ocean Institute Floating Laboratory Specialist will take a head count before boarding the vessel and the number of this count must match the number on the Manifest.

**Program Information Form**

The Program Information Form should be completed and returned to the Ocean Institute at least one month before your program. This information will help us prepare for your program. Use this form to request your missions and inform us of any special needs.



**MEDICAL ISSUES**

The medical forms included in this package must be completely filled out and signed for every student and adult participating in the **Sea Floor Explorer Overnight Program**. Please carefully review the completed forms to ensure that they have been properly filled out and signed. The teacher-in-charge will keep all medical forms as well as be responsible for storing and distributing student medications (both prescription and non-prescription). Please notify the Overnight Coordinator in advance of any participant with special dietary or other needs. We do not have a medical doctor or nurse on site, and we do not have housing for sick students. Parents of ill or injured students will be notified immediately and arrangements made for transportation to the hospital or home.

**STUDENT PREPARATION**

We have found that the more familiar the students are with program concepts and content before they arrive, the more they will benefit from and enjoy their experience. We have included a pre program activity packet and answer sheet to introduce important concepts to your students before they arrive for their program.

**STUDENT BEHAVIORAL EXPECTATIONS**

Please take time to discuss the academic nature of their field experience with your students before arriving at the Ocean Institute. When at the Ocean Institute, we expect that your students will follow the same behavioral rules you have in your classroom.

**STUDENT SAFETY RULES FOR THE *R/V SEA EXPLORER***

The Watershed Science Cruise program takes place on the *R/V Sea Explorer*. When you arrive at the Ocean Institute, you will be met by an Ocean Institute Floating Laboratory Specialist who will review the following safety rules with you and your students.

- Walk at all times while onboard the *R/V Sea Explorer*—running and horseplay are not permitted.
- Keep both feet on the deck at all times, and remember to stay off the rails.
- Keep off the upper deck and access ladder unless permitted by Ocean Institute instructors.
- Keep hands off the equipment until instructed to do otherwise.

**STUDENT CLOTHING AND SUPPLY LIST FOR THE *R/V SEA EXPLORER***

For safety reasons, students participating in the program need to have and/or wear the following clothing.

- Jacket
- Rubber-soled, closed-toe shoes
- Hat
- Sunscreen

Optional Items:

- Camera with film
- Money for the gift and book store
- Seasickness medication

**AVOIDING SEASICKNESS ON THE *R/V SEA EXPLORER***

There are several things that you and your students can do to avoid seasickness:

- Eat a good breakfast or lunch before the cruise—make sure that you avoid sweets and greasy foods!
- Take anti-motion medication at least 30 minutes before boarding the vessel



**LAURENA G. CHAMBERS GALLERY BOOK AND GIFT STORE**

*Chambers Gallery* Book and Gift Store is a fun and unique non-profit museum store open daily from 9:00 AM to 5:00 PM and definitely worth the visit. The revenue is directed toward lowering tuition for schools that participate in Ocean Institute programs.

To help accommodate all of the schools that would like to shop each day, please have one teacher from your school check-in with a store staff member before your students begin shopping.

There will be a limit on the number of students allowed to shop at one time and we encourage you to organize them so that they all have time to enjoy the shop. Please have one or two adults in the store to help supervise your students. We ask that all food, drink, and backpacks be left outside while they are shopping. Teachers receive a 15% discount in the shop if members of the Teachers Club and 10% normally.

Please remind your students that sales tax will be added to their items.

In order to ensure a positive experience, we recommend the following:

1. Plan sufficient time before or after your program to shop.
2. All purchases should be stowed safely away and out of sight for the program.
3. Please allow only 10-12 students in *Chambers Gallery* Book and Gift Store at a time. Remaining students should remain outside in a manner that does not interfere with traffic in and out of the building.

**DIRECTIONS TO THE OCEAN INSTITUTE**

The address of Ocean Institute:  
24200 Dana Point Harbor Drive  
Dana Point, CA 92629  
(949) 496-2274

**Directions from Los Angeles:**

- Travel south on Interstate 5
- Exit on the Pacific Coast Highway Exit
- Stay in the right lane of the exit ramp and go north on P.C.H.
- Turn left onto Dana Point Harbor Drive
- The road ends in the Ocean Institute parking lot

**Directions from San Diego:**

- Travel north on Interstate 5
- Exit on the Beach Cities Exit
- Stay in the left lane of the ramp and go north on P.C.H.
- Turn left onto Dana Point Harbor Drive
- The road ends in the Ocean Institute parking lot

