

WELCOME TO THE EARTH SCIENCE FIELD PROGRAM

We are very proud and excited to present to you the Earth Science Field program!

An important objective of the Ocean Institute is to continually develop new and innovative ways to meet the needs of the teaching community. This exciting program has been developed to meet the specific needs of sixth and seventh grade teachers in addressing the California Science Content Standards. We have developed partnerships with leading scientific institutions to create a series of programs that will place your students in the role of scientists and allow them to experience the excitement of using real equipment and techniques to explore the cutting edge of current scientific knowledge.

Please take a few moments to familiarize yourself with the materials we have included, and share them with other teachers and chaperones who 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 in order to participate in the program.

If you have any questions about your visit to the Ocean Institute, please do not hesitate to contact our Science Program Coordinator, Shanette Grieve at 949-496-2274, extension 339. Again, welcome to the Earth Science Field program! We are looking forward to your visit.

Sincerely,
Rick Baker
Vice President of Education



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A. ADMINISTRATIVE CHECKLIST

Immediately upon receiving this package...

- Carefully review the Teacher Preparation Package
- Arrange your transportation

Two months prior to your trip...

- Arrange for parent chaperones—please limit the number to two adults for every 12 students
- Confirm student and adult numbers with the Ocean Institute

One month prior to your trip...

- Begin student preparation
- Copy and distribute Acknowledgement of Risk and Waiver to each student and adult
- Contact the Ocean Institute with any changes in student numbers

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
- Contact parents to remind them to sign and return the Acknowledgement of Risk and Waiver
- Collect Acknowledgement of Risk and Waiver from each student

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 and appropriate clothing with students
- 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
- Prepare nametags for students and adults

When you arrive for the Earth Science Field Program...

- Unload the bus in front of the Ocean Institute
- Check in at the Student 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



B. DESCRIPTION OF THE EARTH SCIENCE FIELD PROGRAM

Student researchers conduct a series of investigations to find clues that bring to light the geologic history of the Dana Point Headlands and surrounding area. Students will be split into research teams and will rotate through the following stations:

- **Metamorphic Rocks Investigation Station**
Students explore the Dana Point Marine Protected Area, identify at least three metamorphic rocks, and explain their geologic origin. They use the rocks to begin building an explanation of the geologic forces that support plate tectonics.
- **Angle of the Beds Station**
Students use clinometers to identify and measure the angle of the ancient seabed.
- **Mapping Station**
Students locate and map an inactive fault by plotting the rock types found in our courtyard. They also explore plate movement through the *When Barstow Becomes a Beach* activity.
- **Geology Application Station**
Students use a seismometer and oscilloscope to investigate ways that we measure seismic waves.

C. LINKS TO SCIENCE CONTENT STANDARDS

Grade Six

Plate Tectonics and Earth's Structure

- 1.a. Students know evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and midocean ridges; and the distribution of fossils, rock types, and ancient climatic zones.
- 1.b. Students know Earth is composed of several layers: a cold, brittle lithosphere; a hot, convecting mantle; and a dense, metallic core.
- 1.c. Students know lithospheric plates the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.
- 1.e. Students know major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.
- 1.f. Students know how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics.
- 2.d. Students know earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.

Investigation and Experimentation

- 7.b. Students select and use appropriate tools and technology to perform tests, collect data, and display data.
- 7.e. Students recognize whether evidence is consistent with a proposed explanation.
- 7.f. Students read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map.
- 7.g. Students interpret events by sequence and time from natural phenomena.

Grade Seven

Earth and Life History

- 4.a. Students know Earth processes today are similar to those that occurred in the past and slow geologic processes have large cumulative effects over long periods of time.
- 4.c. Students know that the rock cycle includes the formation of new sediment and rocks and that rocks are often found in layers, with the oldest generally on the bottom.

Investigation and Experimentation

- 7.a. Students select and use appropriate tools and technology to perform tests, collect data, and display data.

D. ADMINISTRATIVE PREPARATION FOR THE PROGRAM

ADMINISTRATIVE CONTACT

For questions regarding the **Earth Science Field Program**, please contact:

Shanette Grieve
Director of Program Development
Telephone Number: (949) 496-2274, extension 339
E-mail: 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 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:

- Review the station activities and expected behaviors with the students before you arrive. Make sure they have a clear understanding of the concepts they will explore during the program.
- Carefully choose and prepare your chaperones. Review the station activities and expected student behaviors before you arrive. Make sure that they have a clear understanding of their role as a chaperone.
- Have a signed Acknowledgement of Risk and Waiver for each participant before boarding the bus.
- Notify the Ocean Institute staff of students with any special health or behavioral considerations.
- 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 work with students of different ages and abilities. Both you and the adult chaperones can help the instructors monitor student behavior and safety. There are several things that you can do to help facilitate the smooth running of your educational program:

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

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 2 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 15 minutes before your scheduled program start time. If you arrive late, your program time may need to 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.

ACKNOWLEDGEMENT OF RISK AND WAIVER FORM

Each student must have this form signed by a parent or guardian to participate in any of the Earth Science programs. Please have one signed form for each participant when you check in with Student Services.

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 your students to follow the same behavioral rules you have in your classroom.

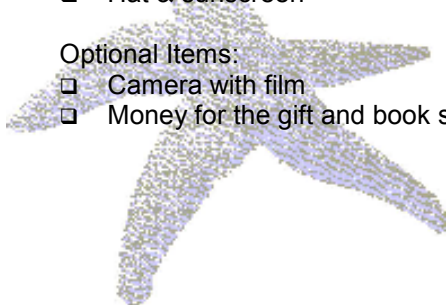
STUDENT CLOTHING AND SUPPLY LIST

For safety reasons, students participating in the program must 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



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.

ADDRESS AND DIRECTIONS TO THE 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

