

**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 at the very 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 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 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 Laboratory Program Director, Linda Blanchard at 949-496-2274, extension 314. Again, welcome to the Earth Science Field program! We are looking forward to your visit.

Sincerely,  
Rick Baker  
Senior Program Director, Science



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**APPENDIX**

Acknowledgement of Risk and Waiver



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

**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 geological investigations of the Dana Point Headlands and surrounding area. Students will rotate through stations and the program culminates with the mapping of an inactive fault.

- **Metamorphic Rocks Investigation Station**

Students explore the Dana Point Marine Life Refuge, 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.

- **Mapping Station**

Students use clinometers to identify and measure the angle of the ancient seabed and use survey equipment. In addition, they locate and map the fault with Global Positioning Systems units.

- **Geology Application Station**

Students explore plate movement through the *When Barstow Becomes a Beach* activity. 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.

### **Grade Eight**

#### Motion

- 1.a. Students know position is defined in relation to some choice of a standard reference point and a set of reference directions.
- 1.c. Students know how to solve problems involving distance, time, and average speed.
- 1.d. Students know the velocity of an object must be described by specifying both the direction and the speed of the object.

#### Forces

- 2.a. Students know a force has both direction and magnitude.
- 2.e. Students know that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).

#### Density and Buoyancy

- 8.c. Students know the buoyant force on an object is an upward force equal to the weight of the fluid the object has displaced.
- 8.d. Students know how to predict whether an object will float or sink.

#### Investigation and Experimentation

- 9.a. Plan and conduct a scientific investigation to test a hypothesis.
- 9.b. Evaluate the accuracy and reproducibility of data.
- 9.e. Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.



## D. ADMINISTRATIVE PREPARATION FOR THE PROGRAM

### ADMINISTRATIVE CONTACT

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

Linda Blanchard, Laboratory Program Director  
Telephone Number: (949) 496-2274, extension 314  
E-mail: [lblanchard@ocean-institute.org](mailto:lblanchard@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 Sea Floor Explorer Series 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

### **CHAMBERS GIFT AND BOOK STORE**

The Chambers Gallery Gift and Book Store is a non-profit museum store open daily from 9:00 AM to 5:00 PM. The revenue is directed toward lowering tuition for schools that participate in Ocean Institute programs. Your class are encouraged to visit the store. To help accommodate all of the schools that plan to shop each day, please have one teacher check in with a store staff member before your students begin shopping.

To ensure that all of your students have time to shop, we limit the number of students allowed to shop at one time as well as have a three-minute limit for each student. Please have several chaperones in the store to supervise your students. One chaperone should stand at the door to monitor the students waiting in line. The other two adults should supervise the shoppers and remind them to make their selections quickly. Please ask the students to leave food, drinks, and backpacks outside while they are shopping, and remind them that sales tax will be added to their items.

**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

