

Introduction: Earth Materials

To extend the learning in this kit, oceanographers from Oregon State University will be happy to come into your classroom as guests to do two 45-minute lessons especially designed for Earth Materials. Please read and review the information below before calling.

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Earth Materials "Suitcase Science" Lessons

What are suitcase lessons?

Marta Torres, Robert Duncan, and Melissa Feldberg as part of a NSF GeoEducation grant (GEO-0224566) have created two oceanography lessons designed to reinforce important science concepts from the FOSS Earth Materials kit, introduce related concepts, and show students the important work oceanographers do. The lessons are age-appropriate and feature hands-on activities, inquiry, the process of scientific research, and the excitement of discovery.

"Suitcase Lessons" are portable modules with complete directions and materials so any OSU Oceanography faculty, graduate student, or a scientist working at an oceanography institute can come to your classroom and successfully present the lessons. For the guest presenter, each kit includes: introductory materials that outline science concepts, detailed descriptions on how to use the materials, alignments to benchmarks, handouts, and a complete set of materials needed to present the lesson to a class of about 30 students.

How were these lessons developed?

The lessons were developed and piloted with input from nine Corvallis 509J District teachers whose input was pivotal to the success of this effort. The teachers met several times with the scientist partners to brainstorm ideas for the lessons and to give feedback about possible lessons. They arranged for the scientist to teach the "suitcase lesson" to their class, and gave pre- and post- knowledge assessment surveys. After the lessons were presented, the teachers provided evaluations on the lessons' effectiveness and offered suggestions for improvement.

What are my responsibilities as a teacher?

- Teach the lessons in the Earth Materials kit.
- The suitcase lessons are designed to be presented near the end or after you have finished with the Earth Materials kit. Call to schedule the suitcase lessons at least one month ahead of time.
- Plan on having your students do the pre-lesson survey question, "What is at the bottom of the ocean and how did it get there?". Share these papers with the guest

- oceanographer.
- Plan on having your students complete a post-lesson assessment (provided by the scientist). Students may begin this assessment during the oceanographer's lesson, but you'll probably need to schedule additional class time to complete the assessment.
- Fill out an evaluation sheet about the presentation based on your students' response to the lesson, your personal observations, and any other input you feel would be valuable.

What will my students learn in these suitcase lessons?

- The main purpose of the lessons is to provide students with the basic knowledge needed to begin to answer these questions:
- How do rocks and minerals form in the ocean?
- What are ocean sediments?
- Where do ocean sediments come from?
- What can you learn about the Earth's history from ocean sediments?

The suitcase lessons will:

- Review the definitions of rocks and minerals learned in the Earth Materials kit.
- Introduce the concept of underwater volcanoes as source of seafloor basalt.
- Explain how sediments form into layers on the ocean bottom.
- Talk about the three main sources of seafloor sediments: volcanoes (ashes), particles carried to the ocean by rivers and wind, and microscopic shells produced by oceanic plants and animals.
- Show how, over time with heat and pressure, microfossils can change into chalk then limestone then marble.
- Explore techniques that oceanographers use to recover sediments from the seafloor and how they interpret the sediment record.

Hands-on activities include:

- Observing rocks and classifying by origin: sedimentary, metamorphic, or igneous.
- Putting sea sediments in a time line: from shells to marble.
- Simulating ocean sediment sampling by "straw-coring" of a layered color-coded sand at the bottom of a cup (a model of an ocean basin).
- Make a scientific drawing of the "straw-core" and use it to make inferences about the history of their "model ocean-basin".