

Cores for Kids

Teacher Guide



Credits: Maya Pincus, Expedition 397

Background

Every time there is a new core on deck, scientists aboard the *JOIDES* Resolution rush to figure out two things: what types of sediments and rocks make up the core, and how old are those sediments and rocks? By recognizing the materials that make up the cores, scientists can infer the ocean environment that formed the core. By identifying the age of the core, scientists can begin to tell the story of Earth's past, by describing what happened at different points in Earth's history. This activity will introduce young students to the fundamental methods that scientists use to interpret the cores they recover from the ocean floor.

Additional Resources

- *Introducing the International Ocean Discovery Program*
 - <https://www.youtube.com/watch?v=0nydKlpZdIU&list=PLroDmZEKRHPMctFMzjx-Zg7plqnIqWMjl&index=2&t=242s>
- *How Science Works*
 - <https://www.youtube.com/watch?v=i9tsdAQBcfM&list=PLroDmZEKRHPMctFMzjx-Zg7plqnIqWMjl&index=3&t=0s>
- *PNN Special Report Life on Board*
 - <https://www.youtube.com/watch?v=n0bcloALDFg&list=PLroDmZEKRHPMctFMzjx-Zg7plqnIqWMjl&index=4&t=341s>

Activity Summary

This two-part activity is designed to introduce young students to the basic principles that scientists aboard the *JOIDES Resolution* apply to interpret the cores they collect from the ocean floor. In Station 1, students learn how paleontologists identify fossils to determine the ages of different layers of sediments and rock in a core. In Station 2, students learn how different ocean environments lead to the appearance of different types of sediments and rock within a core.

Next Generation Science Standards

- **4-ESS1-1:** Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
 - **Science and Engineering Practice**



- Constructing Explanations and Designing Solutions - Identify the evidence that supports particular points in an explanation.
- **Connections to Nature of Science**
 - Science assumes consistent patterns in natural systems.
- **Disciplinary Core Idea**
 - The History of Planet Earth - Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.
- **Crosscutting Concept**
 - Patterns - Patterns can be used as evidence to support an explanation.

National Science Education Standards

- **Teaching Standard A:** Teachers of science plan an inquiry-based science program for their students.
- **Content Standard D:** As a result of their activities in grades K-4, all students should develop an understanding of properties of earth materials. As a result of their activities in grades 5-8, all students should develop an understanding of the structure of the earth system and Earth's history.

Target Audience

This activity is ideal for students aged 7 to 11 years old.

- **Modifications:**
 - Have students draw lines to match the fossils to their ages, instead of writing out the ages
 - Provide students with cut-outs of different rock types to paste into their core so that they don't have to draw
 - Model the activity and provide examples
- **Extensions:**
 - Add additional fossils to the FOSSIL KEY to make the fossil identification more challenging
 - Have students write a "story" to describe how the ocean changed over time, based on the core they created

Time Required

The activity will require about 40 - 60 minutes, but students should have an introduction to scientific ocean drilling prior to the activity.



Materials Needed

- Student worksheet (1 per student OR 1 per group)
- Activity posters (1 per group)
- Colored pencils / crayons

Activity Description

Station 1: Students will observe fossils found in different parts of a core section, then match them to the fossil key to determine the age of each fossil. They will then look for a pattern in the fossil ages to infer that cores get older with increasing depth.

Station 2: Students will read about the different processes that form different types of sediments and rock, then create a four-layer core from their imagination, based on what they learned about sediments and rock.