

What You See Is What You Get

An inquiry-based activity on Visual Core Descriptions

Background

Sight, sound, scent, texture, and taste; we know them as the five senses and began learning about them early in life. Honing our senses improves our ability to navigate from that first waking sensation in the morning until we hit the pillow at night. Honing our sensory abilities can also improve our scientific skills. Good science is based on good observation coupled with good descriptive and recording skills.

Observations of a core begin the moment a scientist first lays eyes on it. The *JOIDES Resolution* is equipped with twelve laboratories, making it possible to observe and analyze the smallest details, but the analytical process begins with visual observations. Is the core made of sediment or hard rock? If it is rock, is it igneous or metamorphic? How big are the grains? How big are the rocks? What colors are they? Are they cracked or veined? Can you see any patterns? The list goes on and on.

Learning Objectives

Students will be able to practice simple visual and geological observation through activities using core photos available through the Integrated Ocean Drilling Program web site.

National Science Education Standards

A: Science as Inquiry

- Abilities necessary to do scientific inquiry;

D: Earth and Space Science

- K-4 Properties of Earth materials
- 5-8 Structure of the Earth system
- 9-12 Origin and evolution of the Earth System

Ocean Literacy Principles

1. The Earth has one big ocean with many features.
5. The ocean supports a great diversity of life and ecosystems.
7. The ocean is largely unexplored.

Target Grade: 5 and Up

Time: 1 Class Period

Equipment and Materials

1. Internet access or core photos
2. Metric rulers
3. Munsell color charts for geology or any means of standardizing colors
4. Earth science or geology textbooks and references
5. Optional: color printer, tape/glue, scissors, magnifiers

Method

1. Divide into small groups of three to four students.
2. Make individual (one per student) Visual Core Description pages as follows: fold a piece of white paper in half lengthwise and draw two 1 cm × 15 cm columns side by side on the left half of the paper. Label one “Graphic Representation” and the other “Color.” Using a scale of 1 cm = 10 cm, label the columns from 0 to 150 cm.
3. Access core photos from Leg 129 by going to <http://iodp.tamu.edu/janusweb/general/dbtable.cgi>. Then click on ODP data at the top and scroll over to number 129 in the top row of the drilling data chart. These cores were drilled from seafloor below 5968 meters (almost 4 miles) of water, the deepest water the *JOIDES Resolution* has ever drilled in!

4. Next, choose Site 802, and then scroll down and click on 59 in the Core Photo Images row. Beginning with Core 3, assign one core to each group.
5. Instruct your students to study and describe the core photo independently. Zoom in as much as possible without blurring the image. Draw shapes and relative sizes in the graphic column and record colors (using the standard provided) in the color column. Make notes about textures, cracks, types of rocks, patterns, and other observations on the right-hand side of the page. Do you notice any patterns or cross-hatching that may have been caused by the drilling process? If so, how can you tell? Some photos have more than one 150 cm core section. Describe as many as time allows.
6. When complete, all group members should meet to discuss and consolidate answers into one report. Label the new report with the leg, site, hole, core, depth in meters, and section numbers, as well as the names of the observers.
7. Now access the actual, hand-written core section description from the data overview for Site 802 (Go back to the Site 802 page, scroll down to Visual Core Description, and click on 153.) and compare with your description. While each photo shows all the sections of a core, each section is described separately; use the depth and section number to find the right description.
8. How closely do your observations match those of the scientists? What questions do you have? How will you go about answering them? (It is quite all right if your observations do not completely match those of the scientists – after all, your scientific career has just begun!)

Extensions

1. Try the same procedure for other important or interesting cores.
 - See Leg 148, Hole 504B in the chart below.
 - Leg 126, Site 788; Leg 168; or Leg 155 represent a bit of variety.
 - Locate the leg or site nearest your home on the drill site map.

Drilling Accomplishments

Deep Sea Drilling Program, 1968–1983,
Drilling Ship - *Glomar Challenger*

Photos and history are available at http://iodp.tamu.edu/publicinfo/glomar_challenger.html.

A bathymetric chart of drill sites like the one pictured here can be downloaded from <http://iodp.tamu.edu/scienceops/maps.html>.

- Number of cores recovered.....19,119
- Total core recovered.....97,056 m
- Number of sites investigated624
- Deepest penetration below the seafloor..1,740 m
- Maximum penetration into basaltic earth crust1,080 m
- Deepest water (Leg 60, Site 461A)7,044 m
- Total Distance Traveled375,632 nmi

Ocean Drilling Program, 1985–2003,
Drilling Ship - *JOIDES Resolution*

See Extensions, above, for photos, history, and virtual tours. The bathymetric chart of Ocean Drilling Program drill sites is located at <http://iodp.tamu.edu/scienceops/maps.html>.

- Number of cores recovered.....35,772
- Total core recovered.....220,704 m
- Number of sites investigated669
- Deepest penetration below seafloor (Leg 148, Hole 504B)2,111 m
- Deepest water (Leg 129).....5,968 m
- Total distance traveled355,781 nmi

Integrated Ocean Drilling Program,
September 2004 through present

- Ongoing. For the latest expedition schedule, see <http://iodp.tamu.edu/scienceops/>.

2. Take a virtual tour of the JOIDES Resolution laboratories at <http://iodp.tamu.edu/labs/ship.html>.
3. Create life-sized core photos, cut them out, and link them together on the wall or floor of your classroom.
4. Follow the progress and see photos of the current expedition at www.joidesresolution.org.