Visual Core Description

Background

When a core has been recovered and processed by a core technician, the next steps are imaging and visual description. All distinguishing characteristics must be noted. These techniques, when practiced carefully and with consistency, provide the first general conclusions about the history of the core and the conditions under which it was formed. Visual core description will also begin to establish the need for sampling and further studies. For more about core processing, watch the *Core on the Floor* video at *http://joidesresolution.org/node/777*.

Learning Objectives

Students will be able to:

- Use their prior knowledge, classroom resources, and the visual identification key and record sheets used by scientists aboard the *JOIDES Resolution* to identify and describe distinguishable characteristics in one or more core sections.

National Science Education Standards

Standard D: Earth and Space Science

Standard G: History and Nature of Science for grades 9-12

Ocean Literacy Principles

1. Earth has one big ocean with many features.
2. The ocean and life in the ocean shape the features of Earth.
7. The ocean is largely unexplored.

Target Age: Grades 9-12, undergraduates

Time: One class period

Materials

- Color poster of core samples
- Visual Core Description (VCD) Record Sheets
- Visual Description Key
- Metric rulers
- Map colors

Vocabulary

Use your textbook and/or geological dictionaries to define the following terms:

- alteration
- contacts
- phenocryst
- structure
- vesicles
- veins

What To Do

1. First, take a few moments to make sure you understand the symbols and colors in the visual description key, and that you and all of your classmates will use them consistently.
2. Place a VCD Record Sheet next to one of the core photos, orienting the top of the record sheet with the top of the photo.
3. Record the core identification information from the poster at the top of the page.
4. Instead of using a scanned image, practice your visual skills by sketching the core in the scanned image column on the left side of the record sheet. (This is the way scientists conducted their work before scanned images were available.)

5. Using the symbols and colors in the visual description key, begin marking all distinguishing features and characteristics in the correct columns at the relative depth of each feature.
6. Enter all relevant information in the columns provided to the right of the image column.
7. Use the blank half of the sheet to record notes, questions, and your own ideas for further study.

Analysis

Use your prior knowledge and/or textbook to answer the following questions.

1. What are some observable characteristics that help identify a rock?
2. What processes that act on ocean crust may cause identifiable traits?
3. How does the flow of water alter some of the processes that previously acted on ocean crust?
4. How does depth in the crust affect the processes acting on the rock?
5. What columns did you leave blank? Why?
6. Why is consistency so important?

Conclusion

Summarize what you've learned about the core or cores you've described with a few general statements.

Extensions

All the data from Expedition 309 is now available at *http://iodp.tamu.edu/scienceops/expeditions/exp309.html*.

For more on core processing, see the *Core on the Floor* video at *http://joidesresolution.org/node/777*.

Expedition 309 Visual Description Key

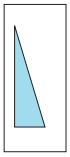
Phenocryst

a	s p	m p	h p
Aphyric (<1%)	Sparsely phyric (1%-5%)	Moderately phyric (5%-10%)	Highly phyric (>10%)

Rock Forming Minerals

Ol = Olivine; Pl = Plagioclase; Cpx = Clinopyroxene; Opx = Orthopyroxene; Amp = Amphibole; Ox = Oxide; Sp = Spinel

Grain size



G	cx	µx	fg	mg	cg	vc
Glassy	Cryptocrystalline (<0.1 mm)	Microcrystalline (0.1-0.2 mm)	Fine grained (0.2-1 mm)	Medium grained (1-2 mm)	Coarse grained (2-5 mm)	Very coarse grained (>5 mm)

Blue rectangles or triangles schematically indicate uniform grain size or gradual increase/decrease in grain size, respectively.

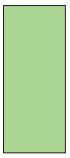
Glass

g	a g
fresh glass	altered glass

Structure

- Chilled Margin (ticks on quenched side)
- Igneous contact
- Dyke contact
- Vesicles
- Pipe vesicles (p)
- Primary ductile deformation (e.g., folded flow tops or bottoms)
- Magmatic Foliation
- Breccia
- Magmatic Vein (M)
- Vein
- Shear Vein
- Vein network
- Conjugate veins
- Joint
- Conjugate joints
- Metamorphic Foliatio
- Microfault
- Slickenline/ slickenfib
- Apparent sense of sh
- Cataclastic zone
- Sv — structural ID for measured structure

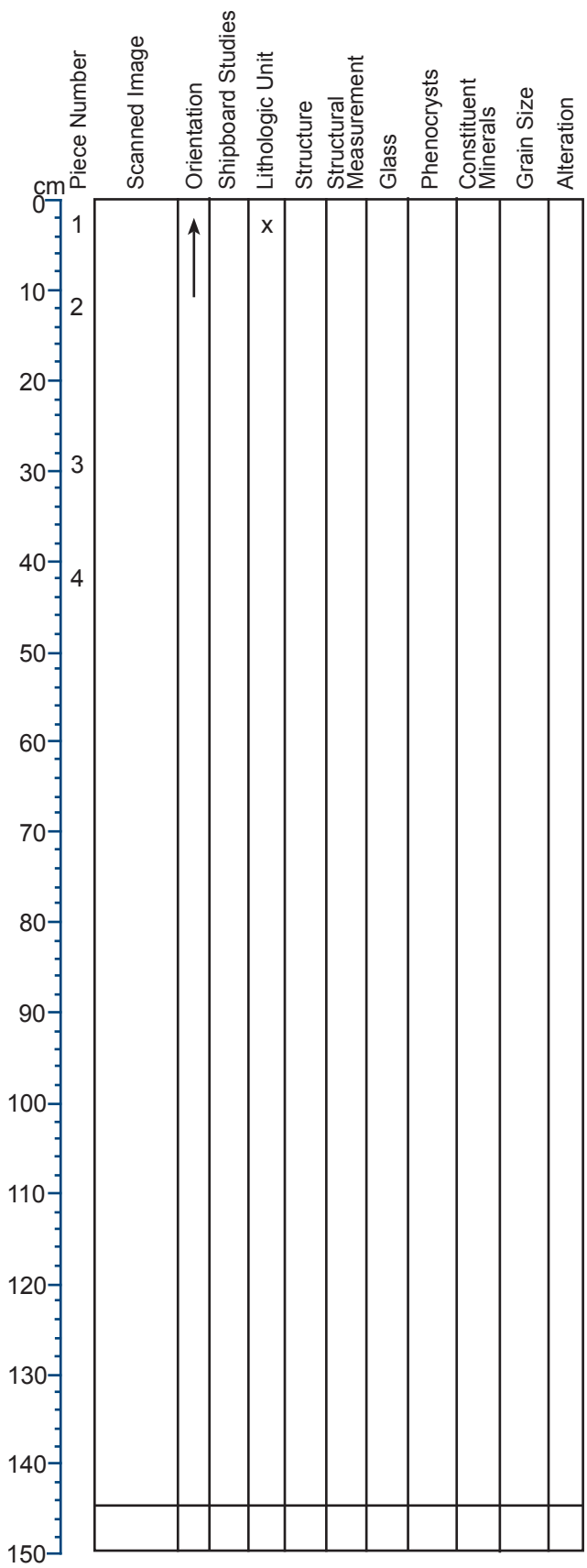
Alteration



f	s	m	h	c
Fresh (<2 %)	Slight (2%-10%)	Moderate (10%-50%)	High (50%-95%)	Complete (95%-100%)

Hydrothermal Mineralization: py = pyrite; cp = chalcopyrite; sp = sphalerite; qz = quartz; chl = chlorite; ep = epidote

Visual Core Description Record Sheet



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