

VIRTUAL CRYSTALLOGRAPHY INTERNET ACTIVITY

Claire L. Godlewski
Grade 6 Science & Reading
Oneida Middle School
Schenectady City School District

Virtual Crystallography Internet Activity

Subject: Earth Science - Geology

Skills:

Following directions, inferring, organizing, recording data, comparing and contrasting, observation, predicting, manipulating software

Duration: Two to three 40 minute sessions

Setting: Classroom and/or Computer Lab

NYS Standards Addressed:

Math, Science, and Technology

1-Scientific Inquiry-develop explanations of natural phenomena in a continuing, creative process.

Students:

° ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.° develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.

2-Information Systems

Information technology is used to retrieve, process, and communicate information and as a tool to enhance learning.

Students:

° understand and use the more advanced features of word processing, spreadsheets, and data-based software.

° model solutions to a range of problems in mathematics, science, and technology using computer simulation software.

3-Mathematics

Students use mathematical modeling/multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships.

Students:

- visualize, represent, and transform two- and three-dimensional shapes.
- use the coordinate plane to explore geometric ideas.

- use appropriate tools to construct and verify geometric relationships.

4-Science

Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.

Students:

- explain how the atmosphere (air), hydrosphere (water), and lithosphere (land) interact, evolve, and change.
- describe volcano and earthquake patterns, the rock cycle, and weather and climate changes.

5-Technology

Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.

Students:

- ° find and use mathematical models that behave in the same manner as the processes under investigation.

Key Vocabulary:

crystallography, geology, geologist, crystal symmetry, luster, hardness, color, cleavage, streak, texture, orientation, GADDS, Laue

Materials:

Computer Lab, or projector for "teacher" computer, with Internet access
Virtual Crystallography PowerPoint slide show
Student packet: Virtual Crystallography Expedition Journal
Pen/pencil

Objectives:

Students will utilize the Internet to become familiar with:

- (a) crystal structures
- (b) how crystals are formed
- (c) how crystals are identified/classified

Method:

Students will use the Virtual Crystallography PowerPoint slide show, the Internet, and the Virtual Crystallography Expedition Journal packet to record definitions and observe crystal structure and formation, as well as manipulate crystal structure models.

Procedure:

- (1) Introduce activity and read through Virtual Crystallography Expedition Journal.
- (2) Teachers can either take class to computer lab and have students work independently (or in groups of 2 or 3), or, use a projector with one computer to show the slide show and complete the activity as a class.
- (3) Allow students to complete Expedition Journal.
- (4) During whole class discussion, students share orally, either in groups or independently, the information they have recorded in their journals and what they have learned.

Assessment:

Students must:

- (a) articulate what they have learned during the discussion
- (b) correctly complete the Virtual Crystallography Expedition Journal
- (c) employ complete sentences and correct spelling throughout the Journal

Modifications:

The activity can be completed as a whole class activity using a projector with the computer. Teacher shows and discusses each slide with class as the class completes the Expedition packet together.

Extentions:

- (1) This can be given as an independent study project.
- (2) Have students design their own expedition using links they find on the websites used in the slide show.

Geologist: _____

Date: _____

Science 6

Period: ____

VIRTUAL CRYSTALLOGRAPHY EXPEDITION JOURNAL

The journey begins...

You are a geologist heading out on an expedition, a "dig". Yes, you get to play in the dirt...well, not really. But you do get to spend some time in the computer lab using the Internet learning to be a "rock hound".

"What do geologists do?" you ask? Good question, and that's what you're going to find out. By the time you're finished with this expedition, you'll be making some predictions about what happens to Earth materials in nature, how people are using them today, and how they may possibly be used in the future.

Use the PowerPoint Virtual Crystallography guide and this Expedition Journal to make your "dig" a success. As you complete your Journal, be sure to ***use complete sentences and correct spelling*** as you make your entries.

Let's get started...Good luck and happy "digging"!

Slide One:

- (1) Crystallography is _____

- (2) List two (2) other facts you learned from the information on this web page.

(a) _____

(b) _____

Slide Three:

(3) Texture is _____

(4) Hardness is _____

(5) Symmetry is _____

(6) Cleavage is _____

(7) Streak is _____

(8) Luster is _____

Slide Four:

(9) GADDS stands for _____
This machine is used to _____

(10) A Laue instrument is used to _____

Slide Five:

(10) List five (5) facts you've learned from this website:

(a) _____

(b) _____

(c) _____

(d) _____

(e) _____

Slide Six:

(11) A crystal is _____

How are some of the rocks and minerals you have seen in your expedition used by people today? _____

How do you think Earth materials might be used by people in the future?
