



Science Unit: *Geology and Plate Tectonics*

Lesson 4: *Fieldtrip to Pacific Museum of the Earth*

School Year: 2011/2012

Developed for: Laura Secord Elementary School, Vancouver School District

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Grade level: Presented to grade 6/7; appropriate for grades 4 – 7 with age appropriate modifications

Duration of lesson: 2 hour and 30 minutes plus travel time

Notes: See the museum's website for up to date information: <http://www.eos.ubc.ca/resources/museum/>. The museum is located at UBC and can be easily reached via public transit. The museum is located a short walk (~15 min) from the main bus loop. Thanks to sponsorship from the Association of Professional Engineers and Geoscientists of British Columbia, programs and tours are currently offered by donation (suggested donation of \$3-5 per student).

Objectives

1. To learn more about geology (rocks and minerals), fossils, plate tectonics and earthquakes.
2. To observe sample of various rocks and minerals.
3. To practice identifying minerals by testing their various properties.

Background Information

The Pacific Museum of the Earth is located on the UBC Vancouver campus. The museum is working to develop itself as a hub for K-12 Earth science teaching resources in western Canada and as such has many resources that can be borrowed by teachers (textbooks, rock and mineral samples, fossils etc.). The museum curator is also available for consultations to discuss lesson planning (as scheduling permits). The museum offers a variety of programs including guided tours of the exhibits and various workshops on specific topics. The museum staff can also customize tours and programs to better fit with your unit of study.

For this field trip the students participated in two different activities, each approximately 1 hour in duration:

- Guided tour
- Mineral Properties workshop

The two classes started with one of the activities and then switched places after a 15-20 minute "stretch & snack" break. Museum volunteers (graduate students in Earth and Ocean Sciences) led the two activities. Following the completion of both activities the classes combined and had an outdoor lunch. There are many outdoor areas to eat at UBC. If the weather is uncooperative there is an indoor cafeteria in the basement of the H.R MacMillan Building (located just south of the museum) that may be available. Following lunch the group elected to hike down to Spanish Banks in order to observe some local geology. Bus pick up was arranged at Spanish Banks (the return hike to UBC is not recommended as it is all uphill). Note that public transit to Spanish Banks is seasonal so a private bus may need to be arranged for pick up.



SCIENTIST IN RESIDENCE PROGRAM

Students were already familiar with many of the topics covered during the fieldtrip but the content can be successfully presented as a stand-alone fieldtrip as well (as mentioned above the guides can customize the activities). The fieldtrip served as a good review point and gave the students a chance to explore some topics in greater detail. In addition, it served as an excellent introduction to plate tectonics and earthquakes and thus the timing served this unit particularly well.

Vocabulary

<u>Minerals:</u>	Pure, naturally occurring inorganic elements or chemical compounds. Have a well-defined chemical composition. The “building blocks” of rocks.
<u>Rocks:</u>	Made up of one or more minerals.
<u>Sedimentary rock:</u>	Rock formed from sediments that become compacted and cemented together over time.
<u>Igneous rock:</u>	Rock formed when magma from the earth's interior cools and hardens.
<u>Metamorphic rock:</u>	Rock formed from pre-existing rocks due to the application of intense heat and pressure.
<u>Magma:</u>	Hot molten rock under earth's surface.
<u>Lava:</u>	Magma that has been forced out onto the surface of the earth.
<u>Intrusive igneous rock:</u>	Formed when magma cools under the earth's surface. Usually cools slowly and results in large crystals.
<u>Extrusive igneous rock:</u>	Formed when magma/lava cools on the earth's surface. Usually cools quickly and results in small crystals.
<u>Cleavage:</u>	The way in which certain minerals fracture along distinct planes. This results from the chemical structure of the mineral's crystals.
<u>Luster:</u>	Describes the shine of a rock/mineral sample.
<u>Streak:</u>	The mark left behind when a rock or mineral is rubbed across a rough surface like a streak plate.

Materials

- All necessary materials are provided as part of the mineral identification workshop