



Amethyst geode
Collection of the Glenbow Museum

From Geodes to Gems
Teacher's Program Guide

TeacherResources
AtGlenbow

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Teacher's Program Guide for School Visits

In this hands-on program students will be guided through a multi-disciplinary exploration of minerals. Specific areas of focus include streak, lustre, texture, hardness and crystal shapes as well as current and historical uses of minerals. *From Geodes to Gems* will take place in the Glenbow Museum's permanent *Treasures of the Mineral World* gallery and allow students to work with and explore the approximately 1,000 specimens of rocks and minerals on display.

This guide will assist you in preparing for your visit to Glenbow Museum. It contains pre-visit lessons, vocabulary terms as well as follow up activities. Engaging in the suggested activities before and after your visit will reinforce the ideas in the program and link classroom learning to the Museum experience. The activities require few materials and can be adjusted to meet the age and needs of your students.

CURRICULUM CONNECTIONS

Grade 3

Science:

Topic A: Rocks and Minerals

3–5 Demonstrate knowledge of materials that comprise Earth’s crust, and demonstrate skill in classifying these materials.

Students will:

1. Compare samples of various kinds of rock, and identify similarities and differences.
2. Given a description of the properties of a particular rock or mineral, identify a sample rock or mineral that matches those properties. Properties that students should be able to describe and interpret include:
 - Colour
 - lustre or “shininess”; e.g., shiny, dull, glassy, metallic, earthy
 - texture; e.g., rough, smooth, uneven
 - hardness, based on scratch tests with available materials
 - presence of carbonates. Note that the presence of carbonates can be tested with vinegar or another mild acid
 - crystal shape for minerals, or overall pattern of rocks.
3. Describe and classify a group of rocks and minerals, based upon the above properties.
4. Recognize that rocks are composed of a variety of materials; and given a coarsegrained rock and magnifier, describe some of the component materials.
5. Recognize and describe the various components within a sample of soil; e.g., clay, sand, pebbles, decaying plants; and describe differences between two different soil samples.
6. Describe ways in which rocks break down to become soil, and demonstrate one or more of these ways; e.g., by shaking a group of small, soft rocks in a jar of water; by striking rocks together. Note: Safety goggles should be used.
7. Describe some common uses of rocks and minerals; and identify examples of those uses within the school, home or local community.

VOCABULARY

- **Rock** The solid mineral material forming part of the surface of the earth and other similar planets, exposed on the surface or underlying the soil or oceans.
- **Mineral** A naturally occurring inorganic substance with a definite chemical composition and a regular internal structure.
- **Crystal** A material in which the atoms are arranged in a rigid geometrical structure marked by symmetry. Crystals often have clearly visible geometrical shapes. Most minerals are crystalline structures.
- **Lustre** The shine from the surface of a mineral. Lustre is important in describing different kinds of minerals. It is usually characterized as metallic, glassy, pearly, or dull.
- **Geode** A nodule of stone having a cavity lined with crystals or mineral matter.
- **Gem** A precious or semiprecious stone, especially when cut and polished or engraved.

LESSON PLANS

PRE-VISIT ACTIVITY

From Geodes to Gems focuses on minerals, but it can often be difficult to distinguish between rocks and minerals. Review with students the differences between them.

1. Ask students what a rock is made of. Be sure to distinguish **how** a rock is made from **what** a rock is made of. How a rock is made determines what kind of a rock it is in the Rock Cycle (igneous, sedimentary, metamorphic), but all rocks are made of the same thing: minerals. A rock is defined as a naturally occurring solid aggregate of two or more minerals.
2. If it is useful, make the analogy of a cookie. A rock is like a cookie, and all the chocolate chips, nuts, Smarties, etc. in a cookie are the minerals it is made of.
3. Ask if you took out any one of those ingredients from the cookie – a nut, or a chocolate chip, or a Smartie – how is that one ingredient different from the cookie? Would it have the same shape as the whole cookie? Would it have the same colour as the whole cookie? Would it taste the same as the whole cookie?

4. Now ask how a single mineral might be different from a rock. By analogy with the cookie, would a single mineral have a different shape than the rock? Would it have a different shape? Review concepts like crystal shape and lustre.

POST-VISIT ACTIVITY

INSTRUCTIONS

At the conclusion of your program, your educator will have given you a bag of mineral samples to distribute to students (pending availability). In the bag is also a slip of paper with questions like those the students worked on during the program. By answering those questions systematically, students should be able to figure out the name of the mineral they have been given.

If students already have a rock, mineral, and/or fossil collection, encourage them to bring in samples from home for others to see. If they do not, encourage them to begin a rock, mineral, and/or fossil collection starting with the mineral they have received from the Glenbow.

RESOURCES

Websites

Sandatlas: <http://www.sandatlas.org/minerals/>

Excellent photo references for a number of different common minerals. Links to good articles on rocks and geologic features.

OUR COLLECTIONS

<http://www.glenbow.org/collections/>