

Hidden Gems Curriculum

Overview

Summary: Hidden Gems is a multi-level exhibit displaying the museum's collection of gems and minerals. While visiting, students will gain an understanding of what a mineral is, the differences between a mineral and a rock, where minerals are found and how they are formed in the Earth, and the value that minerals have as natural resources.

Essential Questions

What is a mineral?

- Minerals are naturally occurring, they are not man-made.
- Minerals are inorganic. They have never been alive and are not made from plants or animals.
- Minerals are solids.
- Minerals have a definite chemical composition.
- Minerals have an ordered atomic arrangement. The chemical elements are arranged in a particular way – this is why minerals form as crystals.

What are the properties of minerals?

- Color – what color is the mineral
- Luster – the way the mineral reflects light
- Hardness – does the mineral scratch easily or not
- Translucence – does light shine through the mineral
- Friability – does the mineral crumble easily

What are the differences between a mineral and a rock?

- Minerals are made up of one element or compound.
- Rocks are made up of two or more minerals.

NGSS Standards

NGSS 4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features.

NGSS 4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

History Social Science Content Standard 4.1: Students demonstrate an understanding of the physical and human geographic features that define places and regions in California.

Pre Visit Activity

To maximize the use of time during your Museum visit, it would be helpful to introduce some key concepts and vocabulary to your students prior to visiting by incorporating the following activity into your lesson plan:

Title: Rocks vs. Minerals

Objective

- To use observation to sort and classify different rocks and minerals based on their properties.
- To understand the distinction between mineral (composed of one element or compound) and rock (composed of various minerals).

Materials Needed

- A collection of rocks and minerals (if this is not available, print out the Minerals vs. Rocks Printable for each group of students)
 - Suggested rocks and minerals include quartz, amethyst, pyrite, lava rock, granite, mica, halite, limestone, marble, sandstone
- A magnifying glass for each student (this enhances the student's observations but is not necessary)
- Four paper plates for each group of students
- One marker for each group of students

Vocabulary

- Gem – a precious or semiprecious stone, especially when cut and polished or engraved
- Mineral – a solid inorganic substance of natural occurrence
- Rock – a solid mixture of one or more minerals
- Fluorescence – when a mineral temporarily absorbs a small amount of ultraviolet light and an instant later releases a small amount of light that is visible to the human eye
- Luster – a gentle sheen or glow of reflected light; the way the mineral reflects light
- Formation – a structure or arrangement of something

Activity

Show an image of a mineral to your students. Ask students to think of words or phrases to describe the mineral. As students share their answers, record the words or phrases. (Here are a few significant observations: made of one “thing”; color; shiny or dull; shape)

Next, show an image of a rock. Ask students to share words or phrases that describe the rock. As students share their answers, record the words or phrases. (Here are a few significant observations: made of many “things”; pieces of other rocks or fossils; shape; color; tiny grains or no grains)

As a class, choose one of the observations the students made and have students write that word or phrase on a paper plate. Working in groups of two, students will sort the rocks and minerals that match that observation by placing them on the paper plate.

Once they have all sorted all the rocks and minerals that match that observation, choose another one and have students write that word or phrase on another paper plate. Have students sort their rocks and minerals again, placing the ones that match the new observation on the paper plate. Repeat this process two more times, choosing two different words or phrases to sort by.

After students have sorted out the rocks and minerals onto their four plates, ask them to discuss and share their experience with the class. Ask them the following clarifying questions:

- What did they notice about the minerals?
- Did any of the rocks or minerals move from one plate to another?
- Did they notice anything unique or different about the rocks and minerals?

Once students have shared their observations with the class, wrap up the activity by briefly explaining the difference between a mineral and a rock and the properties of a mineral that help to classify it.

A mineral is made up of only one element or compound where as a rock is made up of several elements or compounds.

- Color – what color is the mineral
- Luster – the way the mineral reflects light
- Hardness – does the mineral scratch easily or not
- Translucence – does light shine through the mineral
- Friability – does the mineral crumble easily

Explain to students that when they visit the Hidden Gems exhibit, they will learn more about minerals, their uses, where they come from, and how they are classified.

Museum Visit Activity

Before visiting the museum, print out a copy of the Hidden Gems worksheet for each of your students.

Explain to students that they will be observing gems and minerals throughout the exhibit, using the worksheet to record their observations. Review the Hidden Gems worksheet with students prior to your visit, clarifying what information they should collect during the visit.

Since this exhibit is a multi-level exhibit, we recommend dividing students into small groups. Each small group should begin on a different level so that the students are able to comfortably fit into the exhibit space and have time to complete their activities.

While visiting the museum, have students engage with the exhibit by having them complete the Hidden Gems worksheet.

While viewing the specimens on display at each level, engage with students by asking the following questions:

- What do the gems and minerals displayed on this level have in common?
 - Shape, luster, fluorescence, location found, etc.
- Do any of the gems and minerals have similar patterns to their formations?
- What is the gem or mineral used for?
 - Practical uses, jewelry, ornamental, etc.
- Where are the gems and minerals commonly found?