

Earth Science Experiment

Mineral Matters

Note: This experiment is also included with the Middle School Science Experiments that use the ProScope Digital USB Microscope.

During this experiment, you will work in a team to use the ProScope Digital USB Microscope and a computer to collect microscopic images from a variety of mineral specimens. When you compare these specimens, you will be able to determine how they are alike and different by comparing their crystal shapes.

Objectives

In this experiment, you will:

- Collect images from a variety of mineral samples
- Use the images you collect to organize the minerals based on their crystal structure

Materials

- Power Macintosh G3 or better
- ProScope Digital USB Microscope and software
- Mineral samples
- Comparable modern specimens

Procedure

- 1** Prepare the computer for data collection by opening the USB Shot software and connecting the ProScope Digital USB Microscope to one of the computer's USB ports.
- 2** Select one of the mineral samples.
- 3** Using the ProScope Digital USB Microscope, create a still image. Create a folder to store your images. Make sure that you are saving the images in your folder.
- 4** Using a table like the one in the "Data" section on page 2, place your mineral images in the table with their descriptions.
- 5** Examine your samples and group them according to their crystal characteristics.

Data

Mineral	Description

Processing the data

Describe the various shapes of the crystals in your mineral samples using geometric terms to describe them.

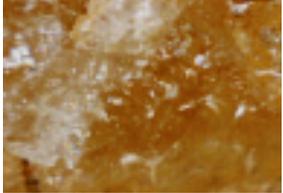
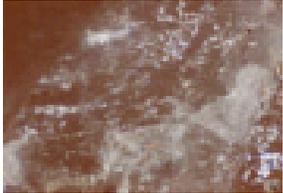
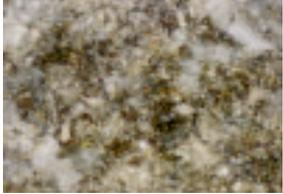
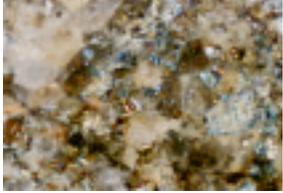
Extensions

1. In addition to the crystal shapes or types found in minerals, what other characteristics are used to organize and identify minerals?
2. Obtain a sample of man-made “rock” and examine its crystal structure. How does it compare to the natural mineral crystals you examined?

Teacher information

Students should refer to a mineral identification resource to supplement their knowledge about minerals.

Sample results

Mineral	Description
Golden Quartz 	Glassy, largely non-existent grain
Rose Quartz 	Glassy, largely non-existent grain
Yellow Micachist 	Fairly fine-grained with non-metallic and waxy luster
K Granite 	Coarse-grained, glassy luster
AU Ore 	Medium-grained and metallic luster

Answers to questions

Processing the data questions

The crystal structures of these minerals contribute to the property that mineralogists refer to as “grain.” The grain can range from coarse to fine, depending on the combination of minerals, but this property is fairly consistent between samples. Also, the luster of the mineral is determined by the crystal nature of the minerals. The luster can be described as glassy, waxy, greasy, metallic, or non-metallic.

Extension questions

1. Other characteristics used to organize and identify minerals include the scratch test, streak test, cleavages, fracture, reaction to acid, and heating.
2. Students could use as a sample a piece of cultured marble, the kind of material that is used for kitchen counters. The main thing that students should observe is the very uniform nature of the crystal structures in the manmade “rock.”

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