

Identifying Minerals

Grade Level:

- 3
- 4
- 5
- 6

Lesson Time:

45 minutes

Objective:

- Students will be able to identify minerals according to physical properties by using color, luster, Moh's hardness scale, the streak test and an identification sheet.

Preparation

Before going to the classroom, you will need to:

1. Contact the teacher to find out the length of the class period, as well as how many copies of handouts and sets of materials you need to bring. Alert the teacher that this investigation is set up for groups of four.
2. Collect all the materials in the list below and organize them into one Tool Bag for each group of four students (zip-closing baggie with 4 hand lenses, 1 porcelain tile, 1 nail, 1 copper penny and 1 glass plate) and one Sample Bag per group (zip-closing baggie with 7 numbered mineral samples in each)
3. Make photocopies of the handouts. Collect any giveaways for the students, such as mineral samples or mineral posters.
4. Run through the investigation yourself and record the data, just to see how long it takes. Adjust the timing to the class period, remembering that you will need time to introduce the investigation, clean up afterwards and re-set up for the next class (if you are working with more than one class). You can reduce the amount of time this investigation takes by cutting the number of mineral samples down and eliminating the hardness test.

Materials:

Provide students, in groups of four, with the following:

- 1 Sample Bag of seven numbered minerals: 1. calcite, 2. feldspar, 3. kaolinite, 4. biotite mica, 5. hematite, 6. galena, and 7. graphite
- 1 Tool Bag with 1 unglazed porcelain tile (approx 10 cm X 10 cm); 1 copper penny; 1 glass plate (approx 10 cm X 10 cm); 1 steel nail; 4 hand lenses
- 1 pen or pencil to record observations
- 1 Observation Sheet per student
- 1 copy of the Mohs' Mineral Hardness Scale per student
- 1 copy of the Mineral Identification sheet per student

Purpose

The purpose of this investigation is to understand how geoscientists identify minerals by color, luster, and tests for streak and hardness.

Safety

This investigation is considered generally safe to do with students. However, please review it for the specific setting, materials, students, and conventional safety precautions.

Investigation Question

How do you identify minerals by their physical properties?

What to do

1. **(5 minutes)** Introduce the idea of minerals by asking students what minerals they have on them (or in them!) Take all responses, and ask students why they think that knowing how to identify different minerals could be important. Again, accept all responses. Let students know that they will be using some of the same techniques that geoscientists use to identify different mineral samples.
2. **(10 minutes)** Work with the teacher to hand out the Sample Bags. Ask students to take the samples out of the bags and take turns examining each one. Give them a few minutes to do this, and then ask them to group the minerals in any way that seems to make sense to them. Take volunteers from each group to explain why they grouped the minerals the way they did.
3. **(10 minutes)** With the teacher's help, hand out the Observation Sheets, the Moh's Hardness Scale, the Mineral Identification Sheets and the Tool Bags. Explain that the way that geoscientists identify minerals by color, luster, streak and hardness is a bit like detective work. The students will need to find clues, through their observations, of what each of the minerals are. Demonstrate how to streak the minerals and how to do the hardness test. Walk the students through the Moh's Hardness Scale handout and the Observation Sheet.
4. **(10 minutes)** Direct the students to take turns using the tools and the different mineral samples. As they make their observations and tests, they should record these data on their observation sheets. When they finish, ask them to compare their data to the Mineral Identification Sheet to find out the names of the mineral samples.
5. **(5 minutes)** When everyone is finished, hold up each mineral sample and ask groups to tell

what they think it is and why. [Answer key is included with this investigation.] Be sure to accept all student responses. Questions you might ask include:

- Which clues worked best to identify your minerals? (*Students usually find the streak test and color the easiest to interpret.*)
- Which clues weren't very useful? Why is that? (*Many students have trouble interpreting the hardness test and younger students are unfamiliar with the term "luster."*)

6. **(5 minutes)** Ask students to put the samples and tools into their separate bags. Collect all the materials for the next class. Thank the students for their time and attention. (If you have giveaways, you can leave them for the teacher to distribute to save time.)

