

Which is Which?

Identifying Minerals

Parent Notes

In this lesson, we will study minerals and learn how to identify and classify them. Minerals are rock objects that contain only one material.

1) Describing an object. How would you describe an object? What kinds of words are used to describe an object?

a) Use senses: sight, smell, taste, touch, and hearing

2) When you describe an object what are some of the properties of that object that you might use?

a) Color, shape, size, weight, smell, taste, texture, or the sound it makes.

Activity

- Give your child the *Examining and Classifying Minerals Worksheet*.
- Give your child the mineral set.
- Have her fill in the description column for each mineral in their set. They may use the magnifying glass included in the kit to assist in their observations.

3) Another visual property of minerals is their luster. Luster is a way of describing the shininess of a material. It is the intensity of quality of the light reflected by an objects surface. There are two basic types of luster: metallic and *nonmetallic*. Materials with a metallic luster shine like a polished metal surface. They are usually dark in color and are always opaque. Nonmetallic luster can described by words such as glassy, brilliant, pearly, silky, greasy, or dull. Can you think of some everyday objects that have these type of lusters?

a) Metallic (nail, chain, toaster)

b) Nonmetallic: drinking glass (glassy luster), chalk (dull luster), graphite (greasy luster), nylon (silky luster)

Activity

- Using the same mineral set, identify the type of luster for each of the samples. Record your observations on the worksheet.

4) Descriptions are just one way we can identify rocks. It is useful for separating minerals that look or feel quite different from each other. But, how can we identify minerals that look quite similar to each other?

a) Physical properties - hardness, how they react to other materials

5) A physical test that scientists use to classify minerals is the hardness or scratch test. This test determines a mineral's resistance to scratching. The Mohs' Scale of Hardness, named after the German mineralogist who developed it, Friedrich Mohs, is used to rank the hardness of a mineral on a scale of 1 (the softest) to 10 (the hardest). This ranking is made based on the relative hardness of a mineral, that is, the hardness of a mineral compared with that of other minerals. In the next activity, we will determine each mineral's hardness by proving the scratch test.

Activity

- Using the back of the worksheet, examine each specimen for hardness. Check to see if the mineral is scratched by a fingernail, a penny (the copper strip included in the kit will work), or a nail (inside the kit).
 - Check if the specimen scratches the glass included in their kit.
 - Using the given scale, determine the hardness number of the mineral and record it in the last column.
 - Copy the hardness number in the appropriate column on the front of the worksheet.
- 6) Sometimes the true color of a mineral is not obvious by looking at a specimen. Minerals are subject the weathering. This can change the surface color of the material. Scientists use the streak test to determine the true color of a specimen.**

- a) To do a streak test, drag the specimen across the white streak plate. Vary the amount of pressure until you obtain a good streak. Be sure to lay the streak plate flat on a table when performing the streak test. Do not hold the plate in your hand -- it could break.

Activity

- Have each team test the colors of the streaks for each mineral and record them on the worksheet. Be careful with number 10, it will crumble if pressed too hard.
- 7) In the final physical test the girls will observe the effects of an acid (vinegar) on each mineral. When moisture in the atmosphere combines with airborne oxides of sulfur and nitrogen, sulfuric and nitric acids are formed. These two chemicals -- known as *acid rain* -- have been proven to cause the deterioration of buildings, statues, and monuments that are constructed of, or have exterior surfaces made from, certain kinds of rocks and minerals. This acid test is used by geologists to confirm the presence of calcium carbonate in rocks. Calcium carbonate reacts with the acid to form carbon dioxide gas. The gas is evident in the form of bubbles or fizzing when drops of vinegar are placed on a mineral sample containing calcium carbonate. In this activity, one of the samples will dissolve since it is soluble in the water contained in vinegar.**

Activity

- Use a nail to scratch a small amount of powder onto a glass plate. Place a drop of vinegar onto the plate and observe any reaction with a magnifying glass.
- If the sample is too hard to scratch, drop the vinegar directly onto the sample. Be sure to wipe off any vinegar on these specimens after the test.
- Record your observations on the worksheet.

Can your child identify each mineral in their kit using the results of all of the tests?