



Field Testing Coal Samples

Objective: Students will administer various field tests on the given coal samples. After performing the tests, students will come to the conclusion that not all types of coal are the same. Students will be able to describe coal samples using simple experiments.

Overview

The students will learn about field testing and how geologists use these tests to identify rocks and minerals. The students will learn how to perform the tests and how to record the results. After all tests are performed and recorded, students will compare their answers and discover that all the four types of coal are different.

Standards Addressed

National Science Education Standards Content Standard A

As a result of activities, students should be able to plan and conduct a simple investigation, employ simple tools and equipment to gather data, and use data to construct a reasonable explanation.

Materials

- Four types of coal samples
- Small magnifying glasses
- Pennies and nails for hardness test
- Ruler or measuring tape with centimeters
- Balance scale or some type of scale to measure weight
- Recording Sheet

Activity Steps

Students will enter information in each of the six boxes on the recording sheet. Specific information for each test is given below.

1. Sketch – Students will make a pencil sketch of the piece of coal. Use colored pencils to shade.
2. Physical Properties – Look at each piece of coal using a magnifying glass. List the words that describe how the piece of coal looks, feels, and smells. Prior to this lesson, the teacher may want to create a word bank of describing words such as rough, smooth, bumpy, wet, slimy, shiny, metallic, sharp, etc.
3. Length – Students should determine which way they will measure each piece of coal. Make a rough sketch of the piece of coal and then draw a line showing the length that was used for the measurement. List the measurement in centimeters.
4. Weight – Depending on the type of scale used, students should write the weight in grams or an equivalent type of measuring unit.
5. Hardness – Students will need to use the penny and nail for the hardness test. To begin, the student should scratch the coal sample gently with the penny. If the penny left a scratch on the coal sample, the student should identify this sample as Soft. If the penny did not scratch the coal sample, then the student should next use the nail to gently scratch the sample. If the nail did scratch it, then the student should identify this sample as Medium. If the nail did not scratch the sample, the coal should be identified as Hard. This hardness test mimics the Mohs Scale of Hardness for minerals.
6. Residue – Students should rub the coal gently in their hands. Did it leave residue on your hands? Students record what happened in the correct box.



LESSON PLAN

Conclusion

Students could get into small groups and compare their answers. Did they each get similar answers for the same coal sample? What conclusions can be drawn about each coal sample? What properties did all the coal samples have in common?

Extension

Create a large chart comparing all coal samples. Students can also find out where each type of coal sample is found and how each one is used. Are certain types of coal better for certain purposes?