Mineral Identification LAB

Group Members: _____
_____
_____

Date _____
Integrated Science III, Period _____

8Sc.5: Summarize the importance of minerals, ores, and fossil fuels as Earth resources on the basis of their physical and chemical properties.

Introduction

Minerals are naturally occurring chemical compounds or elements found in the earth's crust and are the building blocks of rocks. Rocks may contain only a single mineral, but usually they contain a mixture of many minerals.

Most minerals can be easily identified by using properties. In this lab, you will use what you have learned about mineral properties to identify some common rock-forming minerals. Being able to identify minerals will enable you to understand more about the processes that form and change the rocks beneath Earth's surface. In this investigation, you will learn how to use simple tests and tools to identify common minerals.

Materials

Mineral Samples
Hand Lens
Streak plate
Copper penny
Steel nail
Glass plate
Magnet
Piece of quartz
Dilute hydrochloric acid

50-ml graduated cylinder
Tap water
Balance

Thin Thread or string
paper or cloth towels
scissors

LAB SAFETY GLOVES

References - *ScienceSaurus*, pages 179 - 180
Brainpop Video - Mineral Identification

Procedure – Part A: Color and Luster

1. Examine each mineral sample with and without the hand lens. Examine both the central part of each mineral as well as the edges of the samples.
2. Record the color and luster of each sample in the Data Table.

DATA TABLE

Mineral #	Color	Luster	Streak	Relative Hardness	Other Properties	Density				Mineral Name
						m	***V_1***	***V_2***	***d***	
1										
2										
3										
4										
5										
6										
7										
8										

Procedure - Part B: Streak and Hardness

3. To determine the streak of a mineral, gently drag it across the streak plate and observe the color of the powdered mineral. If a mineral is harder than the streak plate (H=7), it will not produce a streak.
4. Record the streak color for each mineral in the Data Table.

5. Use your fingernail, the penny, the glass plate, the steel nail, and the piece of quartz to test the hardness of each mineral. Remember that if a mineral scratches an object, the mineral is harder than the object. If an object scratches a mineral, the mineral is softer than the object.
6. Record the hardness values for each sample in the Data Table.

Procedure - Part C: Density

7. Using a balance, determine the mass of your mineral samples. Record the mass in the first column (m) under density.
8. Cut a piece of string about 20 cm long. Tie a small piece of one mineral sample to one end of the thread.
9. Securely tie the other end of the thread to a pencil or pen.
10. Fill the graduated cylinder about half-full with water. Record the exact volume of the water in the second column (V_1) under Density.
11. Lower the mineral into the graduated cylinder. Read the volume of the water. Record the volume in the third column *(V_2).*
12. *Calculate the density of the mineral using the following equation:*

$$\frac{\textit{Mass}}{\text{volume}_2 - \text{volume}_1}$$

Record this value in the fourth column (d). Repeat steps 10-15 for the other minerals. Record the densities in the Data Table.

Procedure - Part D: Other Properties

13. Use the magnet to determine if any of the minerals are magnetic. Record your observations in the Data Table under Other Properties

14. Place the transparent minerals over a word on this page to see if any have the property of double refraction. If a mineral has this property, you will see two sets of the word. Record your observations in the last column under Other Properties.

15. Compare the feel of the minerals. In the Data Table, note any differences in the last column.

16. Carefully place one or two drops of diluted hydrochloric acid on each mineral. Record your observations in the last column. When you are finished with the test, wash the minerals well with tap water to rinse away the acid.
CAUTION: *Always be careful and use SAFETY GLOVES & GOGGLES when working with acids!!!*

Analysis and Conclusions

1. Which of the properties did you find most useful? Least Useful? Give reasons for your answers.

2. Let's say that I had a huge box of minerals that were not identified. Would it be smart to classify them by color? Why or why not?

3. Classify your minerals into at least three groups based on your observations.

Group 1 =

Group 2 =

Group 3 =