

Name _____
Mrs. Krieger

Date _____

MINERAL MINING

Introduction:

Mining companies have frequently made the news in terms of the destruction they cause to the environment. However, because of the demand for minerals and metals, mining will continue to occur. In the following activities, you will observe some of the problems faced by modern miners in a time of increased environmental concern.

Materials:

Cookie
Copper Sulfate Solution
Graduated Cylinder
Balance

Toothpick
Iron Nails
Beaker



Procedure:

Part A: Cookie Mining

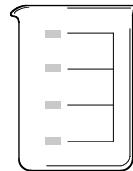
1. Place a cookie on a paper towel.
2. You will try to remove as many chips as possible in one minute.
3. You may use a toothpick or your hands to help you.
4. Partial chips may be counted as long as the piece is larger than one half chip.
5. **IMPORTANT:** Chips can only be counted if the cookie does NOT fall apart.
6. Your teacher will tell you when to start and stop!

Questions:

1. How many Chips were you able to recover? (You can eat your cookie now!) _____
2. How was this situation similar to actual mining? _____
3. Is it possible to mine material and do **no** damage to the environment? Explain. _____
4. What will environmental restrictions do to the price of metals and minerals? _____
5. What will the **lack** of mining restrictions cost? (This includes, but is not restricted to financial considerations). _____

Part B: Copper Recovery

1. Place 3 g of copper sulfate into a beaker.
2. Add 50 mL of water to the beaker to dissolve the copper sulfate.
3. Observe the color of the solution.
4. Add the nails (scrap iron) to the beaker. Observe color changes in the solution.
5. Place the nails on a paper towel, and carefully clean out the beaker in the sink.



Questions:

1. What happened to the nails after you placed them in the solution? What is the material on the nails? Explain your answer.

2. Form a hypothesis that describes how a mine might recover copper from mine water using the method that you have just tried.

3. What additional step would you have to perform to obtain copper useful for making copper wire or pennies?

4. Why do you think the operator of a copper mine would want to collect copper from the waste water?

