Name:

Skill Sheet 29-B Mohs Hardness Scale

Mohs hardness scale was developed in 1812 by Friedrick Mohs (an Austrian mineral expert) as a method to identify minerals. This scale uses 10 common minerals to represent variations in hardness. You can identify a mineral's place on the hardness scale by whether it can scratch another mineral. For example, gypsum (hardness = 2) scratches talc (hardness = 1). The hardest mineral, a diamond, can scratch all other minerals. Pure minerals of the same hardness scratch each other. In this skill sheet, you will practice using Mohs Hardness Scale and work with the minerals in your Rocks and Minerals Set.

1. Collecting the minerals of Mohs Hardness Scale

1. From your Rocks and Minerals Set, collect the minerals listed in Table 1. The only mineral you will not find is a diamond. Why?

2. The piece of porcelain in the set is used to determine the streak color of minerals. Scratch each mineral on the porcelain and record the streak color in the third column of Table 1.
3. In the fourth column, describe what each mineral looks like. Describe its color, texture, and anything else that would help you distinguish this mineral. Use the small magnifying glass in the kit to help you.

Table 1: Mohs Hardness Scale

Mineral	Hardness	Color of Streak on Streak plate	Description
Talc	1		
Gypsum	2		
Calcite	3		
Fluorite	4		
Apatite	5		
Orthoclase (Feldspar)	6		
Quartz	7		
Topaz	8		
Corundum	9		
Diamond	10	N/A	clear, sparkly

2. Applying your knowledge

a. Prove to yourself that the placement of the minerals on the Mohs Hardness Scale is correct. How would you do this? Write your procedure as a short paragraph and then perform the procedure.

b. Is the Mohs Hardness Scale value for a mineral a quantitative or a qualitative number? Justify your answer to this question.

c. List two pros and two cons for using the Mohs hardness scale to identify minerals.

d. Is the Mohs Hardness Scale useful for identifying rocks? Why or why not.

e. Some varieties of the mineral corundum are gemstones. Rubies and sapphires are two examples. Imagine that you have heard a report that there is a newly discovered mine that is rich in corundum. You have been hired to verify the reports. For your first field trip, design two tests you will use to determine if the mineral in the mine is in fact corundum.

3. What are the hardness values for other objects?

When geologists are in the field, they do not have a whole set of mineral samples to represent each hardness value on the Mohs Hardness Scale. Instead, they often use things like a pocket knife or their fingernail to identify the hardness of mineral samples.

Use the clues (a - g) to help you identify the hardness values for the objects listed in Table 2. First, read the following instructions for how to fill in the table.

Instructions for filling in Table 2: In the top row are items that you could use to identify the hardness of a mineral. Read the clues to identify the hardness of each. The information in Table 1 will be helpful to you as well. Place a circle (**O**) in the table cell where the object and its hardness match. Where hardness and the object do not match up, place an **X**. The first two clues are done for you to illustrate how to fill in the table.

Clues:

a. A diamond is considered to be the hardest mineral.
b. Pyrite is harder than calcite.
c. The hardness of a fingernail is 2.5. Ice does not leave scratches on a fingernail.
d. Calcite and copper have similar hardness.
e. A pocketknife is a good tool to take on geology field trips. A pocket knife is helpful in that it can scratch half of the minerals on the Mohs Hardness Scale.
f. Pure apatite and fluorite can be scratched by iron. Iron can be scratched by quartz.
g. A pocket knife can scratch fool's gold.

Table 2: Mohs Hardness Scale

	Copper wire	Pocket knife	Pyrite	Diamond	Iron nail	Ice
1.5			X	X		
3			X	X		
4 - 5				X		
5.5				X		
6 - 6.5				X		
10	X	X	X	O	X	X