

PROPERTIES OF MINERALS LAB

Key Concept: Each mineral has characteristic properties that can be used to identify it.

Properties geologists use to help identify minerals are:

- Color** – easy to observe, but only a few minerals can be identified by color alone. Impurities can contaminate the mineral changing its color. For example, quartz can be white, pink, or purple.
- Streak** – the color of a mineral's powder. Use a streak plate to determine. While a mineral's color may change, the color of its streak usually does not.

Luster – how a mineral reflects light – shiny, metallic, waxy, dull, greasy

Hardness – How easily a mineral can be scratched. Measured by a scratch test.

- Cleavage and Fracture** – the way a mineral breaks apart.
- Cleavage** – splits easily into flat pieces.
 - Fracture** – break along flat smooth surfaces

Station 1: Color & Streak

Part 1: COLOR – The samples at this station area all quartz.

- DESCRIBE/list all of the different colors present.
- WHY is color alone not a good indicator of mineral type?

Part 2: STREAK – Take a mineral and rub it across an unglazed porcelain plate (streak plate). Metallic minerals often have a black streak, while nonmetallic minerals are usually a very light shade of the mineral. Some minerals will not streak at all. If there is no streak, you will write none.

Mineral Name	Description of Streak Formed (or write none)

Station 2: Hardness

This scale lists 10 minerals in order of increasing hardness (1 being the softest and 10 being the hardest). To test for hardness you must determine which is the hardest mineral that it can scratch.

Part 1: Theoretical Practice

- Galena can scratch other samples of galena, but not calcite. What two numbers must it fall between?
- An unknown mineral A will scratch the surface of a penny, but not scratch the glass plate. What is its approximate hardness?

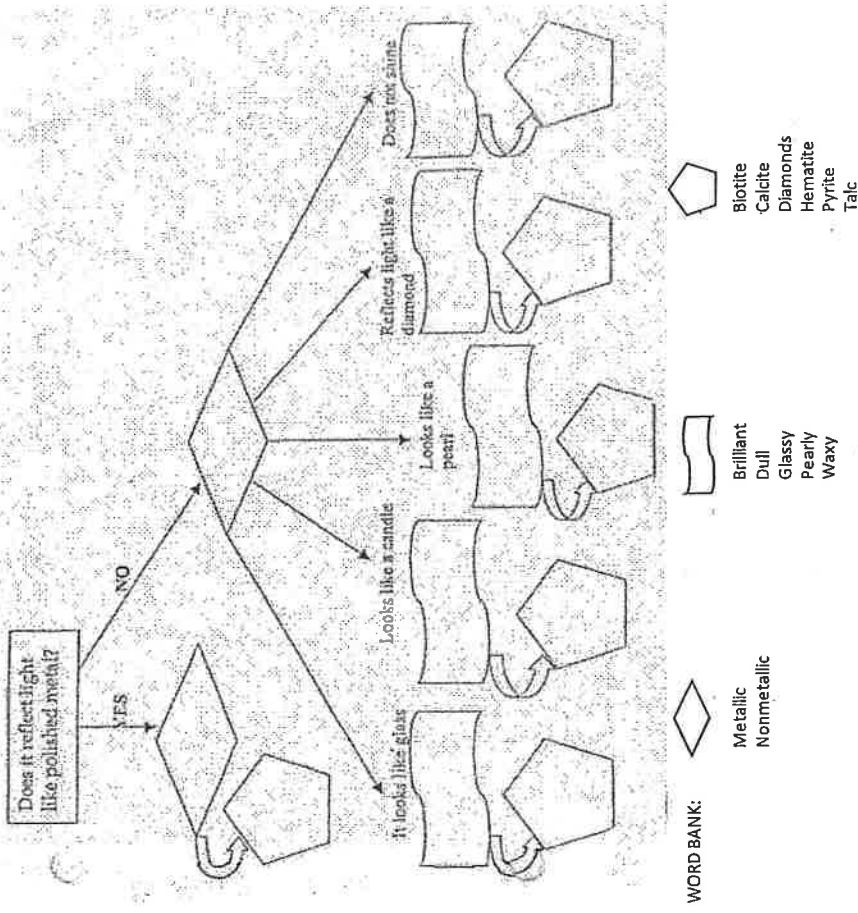
Mineral	Hardness	Common object
Diamond	10	
Corundum	9	
Topaz	8	
Quartz	7	
Feldspar	6	Steel file (6.5)
Apatite	5	Glass (5.5)
Fluorite	4	Iron nail (4.5)
Calcite	3	Copper penny (3)
Gypsum	2	Fingernail (2.5)
Talc	1	

Part 2: Actual Samples – using the supplies at this station, determine the hardness of each of the minerals.

Mineral Name	Hardness

Station 3: Luster

Use your notes and the provided word bank to fill in the flow chart below.



Station 4: Cleavage vs Fracture

When minerals break along certain even lines, they are said to demonstrate cleavage. If they break along uneven, jagged lines, they are said to demonstrate fracture.

Look at the minerals at this station. Classify them as either demonstrating cleavage or fracture. Write the names below.

Demonstrate Cleavage

Demonstrate Fracture

Station 5: Special Properties

Some minerals exhibit special properties that make them easy to identify. You will be able to see some of these today.

Part 1: Magnetism

1. Which of the minerals shown is *magnetite*? (write the letter of the sample)
2. How many paperclips was your group able to pick up with magnetite?

Part 2: Fluorescence

1. Which of the samples shown do you predict will change color in the presence of a black light?
2. What color was the sample originally?
3. What color did it become?

Part 3: Double Refraction

1. What is the name of the mineral that exhibits this property?
2. Sketch below what the example of double refraction looked like.

Part 4: Effervescence (Reacts with acid):

1. What is the name of the mineral that exhibits this property?
2. Describe what you saw as a result of acid being dropped on the surface of this mineral.

Station 6: Questions on Streak

Use the handout provided to answer the following:

1. What are the three properties that help in the identification of minerals?
2. What do we call a scientist who studies minerals?
3. WHY may the surface of a mineral be a different color than the interior of the mineral?
4. Would the hardness of a mineral affect its performance in the streak test? WHY or WHY NOT?
5. Using the graphite in a pencil, perform the streak test. What color does it make?

Station 7: Questions on Hardness

Use the handout provided to answer the following:

1. Who was Friedrich Mohs?
2. Will calcite scratch feldspar? WHY or WHY NOT?
3. Will fluorite scratch a penny? WHY or WHY NOT?
4. What is the softest mineral? What is the hardest mineral?
5. Will apatite scratch glass? WHY or WHY NOT?

Station 8: Questions on Luster

Use the handout provided to answer the following:

1. The luster test separates what two groups of minerals?
2. What are two examples of metallic minerals?
3. What is specific gravity?
4. WHY is knowing the specific gravity of a mineral important?
5. A sample of a mineral has a mass of 23.67g in air and 16.95g in water. Calculate its specific gravity.

Station 9: Practice with Mohs Hardness Scale

Imagine that you have been given samples of each of the ten minerals listed in Mohs Hardness Scale. However, instead of being labeled by name, they are labeled only with code letters. Use the following clues and the Mohs Hardness Chart to determine the identity of each mineral. Write your results in the table below.

Clues:

1. Mineral A scratches minerals E and I, but it can be scratched by mineral J.
2. Mineral C can be scratched by every other mineral.
3. Mineral E can scratch mineral I.
4. Mineral F can scratch only mineral C.
5. Mineral B can scratch mineral F, but it can be scratched by all the other minerals.
6. Mineral H can scratch every other mineral.
7. Mineral D can be scratched only by mineral H.
8. Mineral G can be scratched by minerals H and D; it can scratch mineral J.

Mineral	Hardness
Diamond	10
Corundum	9
Topaz	8
Quartz	7
Feldspar	6
Apatite	5
Fluorite	4
Calcite	3
Gypsum	2
Talc	1

CODE LETTER	MINERAL NAME
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	