

Name _____

LAB: MINERALS

- GOALS:**
- 1) You should be able to recognize (determine) the physical properties of a mineral.
 - 2) Learn to identify an unknown mineral using the mineral charts in your lab book.
 - 3) Learn to identify on sight the following minerals (both as individual samples and in rocks)

quartz	calcite	halite	feldspar	gypsum	galena
olivine	pyrite	garnet	sulfur	hematite	micas: muscovite, biotite
	tourmaline		amphibole (hornblende)		

MINERAL PROPERTIES:

Luster - the appearance of a mineral in reflected light. How it "shines".

Metallic - metallic will look like a metal and may be tarnished.

Vitreous/Glassy (shines like glass)

Waxy or Pearly -has a muted shine

Resinous - has an oily look

Earthy - dull or chalky

Hardness - resistance to scratching.

Usually compared to glass (5.5), steel (5-6), penny (3.5), fingernail (2.5).

Moh's Scale of Hardness is a standard that ranks hardness from 1-10.

Crystal Form - the geometric shape of a mineral crystal. eg. Hexagonal, cubic, pyramid terminations.

Cleavage - the tendency of a mineral to break along planar surfaces.

Count the number of intersecting planes and their angle to each other. Example: a cube breaks along three perpendicular planes.

Cleavage may appear as internal fractures in a crystal, or as step-like surfaces that reflect simultaneously.

Fracture - a mineral that has no cleavage, breaks irregularly, may have a distinctive fracture pattern.

Example: CONCHOIDAL is a curved breakage surface commonly seen in glass.

Streak - color of a mineral when powdered or "streaked" on unglazed porcelain (a streak plate).

Others: magnetic, salty taste, reaction to Hydrochloric acid (HCl), striated surfaces, specific gravity = how heavy it feels.

MINERAL SETS:

- The mineral sets contain numbered mineral samples.
- Some samples are broken cleavage fragments, others are crystals.
- Those that have 2 samples consist of one cleavage fragment AND one crystal.
- Note that not all the crystals are "PERFECT". For example, a cubic cleavage might look rectangular, but all the angles will still be 90°.

Learn to recognize different mineral properties.

The diagnostic properties of some important minerals are listed in the Mineral Data Chart.

Learn to recognize these properties by studying the mineral samples in your set.

PROCEDURES:

FILL OUT THE

Record the following info on the Mineral Data Sheet:

ENTIRE CHART!!!

1. Magnetic – Use the magnet in the test kit to determine which mineral(s) are magnetic.
2. **LUSTER**: In the “Luster” column, record the luster for minerals with open cells.
3. **Hardness**: Confirm the HARDNESS of minerals with open cells:
record whether each is
 - harder than glass (>5.5), -barely scratches glass or scratches it easily
 - between glass and a penny (3.5-5.5)
 - between a penny and fingernail (2.5-3.5)
 - softer than a fingernail (<2.5).
4. Determine the characteristic **CLEAVAGE** for minerals with open cells.
5. Record the **crystal form** for the samples that are cubic or hexagonal. (space is marked with “_____”)
Note that garnet (#12) has a dodecahedral crystal shape.
What is a dodecahedron? How many faces or sides does it have? _____
6. Test and record the **streak** for minerals with open cells. Smell the streak for # 25 (very distinctive!)
Streak is useful for distinguishing **metallic** minerals.
7. Use the Mineral Identification charts in your lab book to identify minerals # 1, 2, 3, 8, 16, and 27.
Check your answers with the **Mineral Data Sheet** in the lab handout.
8. **ANSWER the questions** on the last page.
9. Review the samples that have an asterisk (*) - these are the common **Rock-forming Minerals**.
(you might circle the properties that are most useful for identifying that mineral)

UNKNOWN:

1. Identify the unknown minerals **using your Mineral Data Chart and the charts in your lab book**.
Record the appropriate information on the “Unknown” Chart. Note that recording the correct identifying properties is AS IMPORTANT as the correct mineral name.
2. Identify your individual unknown mineral – complete the information on the chart.

No.	Color	Luster	Hardness	Cleavage/Fracture	Crystal Form	Other diagnostic Properties	Name
1	Variable	Pearly	Softer than fingernail				
2				1 perfect plane			
3							
4/5	Can be many colors				Cubic		Fluorite
6	Can be many colors			None			Apatite
7				2 planes at 90°	Hexagonal		Potassium Feldspar
8				Conchoidal Fracture			
37		Vitreous	Harder than > glass				Olivine
9							Corundum
40							Muscovite Mica
39							Biotite Mica
11		Satiny		2 planes at 60° & 120°			Hornblende Amphibole
35/36					Dodecahedron		Garnet
38				None/conchoidal	Triangular cross sections		Tourmaline

No.	Color	Luster	Hardness	Cleavage/Fracture	Crystal Form	Other diagnostic Properties	Name
33							Pyroxene
32			Barely scratches glass				Plagioclase Feldspar
27		Waxy-vitros					
23							Sulfur
15				None			Bornite
13							Native Copper
16				None		_____ Streak	
26							Graphite
20			Harder than Glass			_____ Streak	Pyrite
21		Metallic Earthy				_____ Streak	Hematite
22							Magnetite
24							Galena
25		Reinous				_____ Streak (smells sulfury)	Sphalerite

Mineral UNKNOWNs

Use the mineral tables in the lab book to identify the Mineral Unknowns. Be sure you record only the properties that apply to your sample!!

#	COLOR	LUSTER	HARDNESS	Cleavage/Fracture <u>OR</u> Crystal Form		Other diagnostic Properties	Mineral Name
A							
B							
C							
D							
E							
F							
G							
H							
I							
J							

Questions Page

Use **NAMES** for minerals, not just sample numbers to answer the following questions.

1. Which mineral is known as “fool’s gold”? _____

Notice the striations on the crystal faces.

Find 2 other minerals that have striations: _____ & _____

2. What are **2 distinguishing differences** between **halite** and **calcite**?

List specific properties. Example: halite has _____ cleavage, calcite has _____ cleavage.

3. What are 2 distinguishing differences between **calcite** and **gypsum**?

4. What are 2 distinguishing differences between **hematite** and **galena**?

5. Describe two properties used to distinguish a sample of purple **fluorite** from **amethyst** (purple quartz)?

6. What are 2 distinguishing differences between **hornblende amphibole** and **biotite mica**?
