

Properties of Minerals

November 12, 2014



1

Mineral Identification Lab

- Everyone gets their own mineral identification lab sheet and reference sheet.
- Attach both into your notebook. Will be part of this month's notebook check and be part of your science notes.

Inventory Check!

- Paper plate with 8 minerals
- Decide the number designation of each mineral and place them in the proper wedge on the plate.
- Testing kit with:
 - Testing Tray, Nail, Penny, Glass, Streak Plate, Magnifying Glass, and Small Magnet
- **Your Task**
 - Use the lab sheet directions and reference materials to identify all eight minerals.
 - You will be directed as to when it is your turn to visit the *Density Station*

2

Helpful Textbook Pages: [84-91](#); [717](#); [Glossary](#)

Today's Main Idea

- Minerals can be identified by their crystalline structure, color, luster, streak color, hardness, cleavage/fracture and density.

Explore Question

2. Explore today's main idea with this question:
The mineral fluorite can be several colors, yet its streak color is always white. Why?

Vocabulary

- Ore
- Gem
- Reclamation

3

Make-Up Notes for those that missed the lab:

4

Mineral Reference Sheet

Color: Color can sometimes be useful in identifying minerals, but it is the least useful in identifying minerals.

Luster: How light is reflected off the surface of the mineral.
 Metallic Shiny Earthy/Dull

Streak Color: The color that is left behind when scratched on a streak plate. The streak plate is made out of porcelain (white square in your kit).

Hardness: The ability to resist scratching.

Moh's scale follows 1, softest to 10, hardest.

Harder objects will scratch softer objects.

Mohs Scale of Hardness

Mineral	Streak Number	Common Objects
Talc	1	
Gypsum	2	
Calcite	3	Plasterboard
Fluorite	4	Chisel Point
Apatite	5	
Orthoclase	6	Steel Nail
Quartz	7	Glass Plate
Topaz	8	Streak Plate
Corundum	9	
Diamond	10	

Cleavage: The ability of a mineral to break along preferred planes. A "smooth" break.

Fracture: When a mineral does not break in a predictable pattern. Opposite of cleavage. A more "rough" break.

Density: All of the same kind of minerals have the same density.
 $Density = \frac{mass\ in\ grams}{volume\ in\ milliliters}$

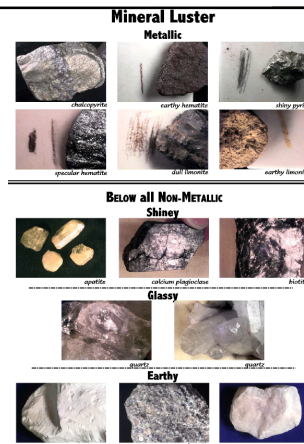
Volume with a Graduated Cylinder:

When reading the volume of a graduated cylinder, take your measurement at the meniscus, where the water "dips" down. Estimate one digit past the scale on the graduated cylinder. If the scale gives one the decimal place, then you estimate the second decimal place.
 Example shows a volume of 40.33 mL.

5

Luster

- The way light is reflected from a cut surface of a mineral.
 - **Metallic Luster**
 - hard, shiny
 - **Nonmetallic Luster**
 - shiny, glassy, waxy, pearly, earthy (dull)



Streak

- Rubbing a fresh corner of the mineral across a white, unglazed streak plate.
- The streak is the powdered form of the mineral.
- Some metallic minerals leave behind a powder that is not the same color as the mineral.



{ 7 }

Hardness

- Minerals can be tested by scratching the unknown mineral with the edge or point of other minerals of known hardness.



{ 8 }

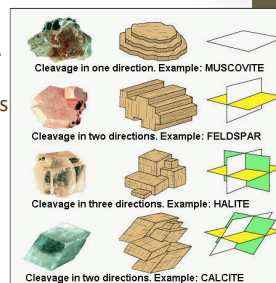
Mohs Scale of Hardness

Mineral	Hardness	Common Household Substance
talc	1	plastic (1)
gypsum	2	salt (2.3)
calcite	3	fingernail (2.5)
fluorite	4	GOLD 2.5-3
apatite	5	copper coin (5)
orthoclase	6	window glass (5.5)
quartz	7	pen knife (6.5)
topaz	8	
corundum (sapphire)	9	
diamond	10	

{ 9 }

Cleavage

- If a mineral breaks along a flat surface, it shows cleavage (to cut, or cleave).
- Many minerals break along cleavage planes, sometimes parallel to the sides of crystals.
- Those that break along even surfaces that do not follow the crystal arrangement are said to **fracture**.



{ 10 }

Density

- Can be found by either dividing the mass of a sample by its volume or flotation.
- Water's density is 1 g/cm³
- A substance will sink in water if it is more dense and float if it is less dense.

$$\text{Density} = \frac{\text{mass (g)}}{\text{volume (cm}^3\text{)}}$$

{ 11 }