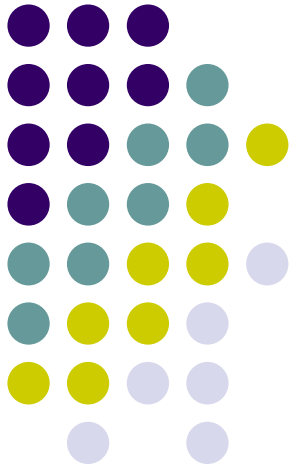
Mineral Identification

Gillespie Museum
STETSON UNIVERSITY

Let’s identify some minerals!



What do good scientists do?

GOOD SCIENTISTS…

- work together and share their information.
- observe carefully.
- record their observations.
- learn from their observations and continue to test, examine, and discuss.

What are minerals?

MINERALS ARE…

- matter.
- inorganic (nonliving) solids found in nature.
- made up of elements such as

  silicon, oxygen, carbon, iron.
  (Si O C Fe)

- **NOT ROCKS!!** Rocks are **made up** of minerals.

Physical Properties

- What are physical properties of matter?
  - Shape, color, texture, size, etc.
- The physical properties of minerals are…

- Transparency
- Luster
- Fracture
- Cleavage
- Specific Gravity
- Crystal Form

- COLOR
- STREAK
- HARDNESS

Physical Properties

- Some physical properties of minerals we won't be examining in this lab:

Transparency	How well light passes through
Fracture/Cleavage	How it breaks
Crystal Form	The pattern of its crystal formation

Color

Some minerals are easy to identify by color.

- Malachite is always green.

But the color of other minerals change when there are traces of other elements.

- Quartz is clear in its purest form.
- With traces of iron, it becomes purple…amethyst.
- With traces of manganese, it become pink…rose quartz.

Takeaway: Visual color helps in identification. Because visual color can be affected by traces of elements, scientists use another test, of streak color.

Streak

- Rubbing a mineral firmly across an unglazed porcelain tile (streak plate) leaves a line of powder.

- The *streak color* of a mineral is always the same, regardless of its visual color.
  - For instance, both amethyst and rose quartz leave the white streak of quartz in its purest form.

Takeaway: Streak color is an even more reliable way to identify a mineral.

Mineral Identification Lab

Fill in the chart on your worksheet by describing color, streak color, and any other interesting things you notice. Once you've recorded color and streak, look at the "Identification" chart to find the mineral names.

Number	Color	Streak	Name	What else?
1 				
2 				
3 				
4 				
5 				
6 				

Color Example…

Number	Color	Streak	Name	What else?
1 	Black/Gray			
2 				
3 				
4 				
5 				
6 				

Color Word Bank

Gold

Clear

Silver

Black

Yellow

Gray

White

Orange

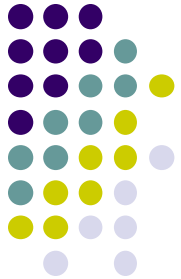
Streak Example…

Number	Color	Streak	Name	What else?
1 	Black/Gray	Red/Brown		
2 				
3 				
4 				
5 				
6 				

Identification: What is it called?

Color	Streak	NAME
Gold/Orange	White/Clear	CALCITE
Silver/Gray	Black/Gray	GALENA
Black/Gray	Red/Brown	HEMATITE
Gold/Silver	Gray/Black	PYRITE
White/Clear	White	QUARTZ
Yellow	Yellow/White	SULFUR

Hardness:
Want to know more?



- Another property scientists use for identifying a mineral is its **hardness**. A glass plate is used for this test. Some minerals will scratch glass; others will not.

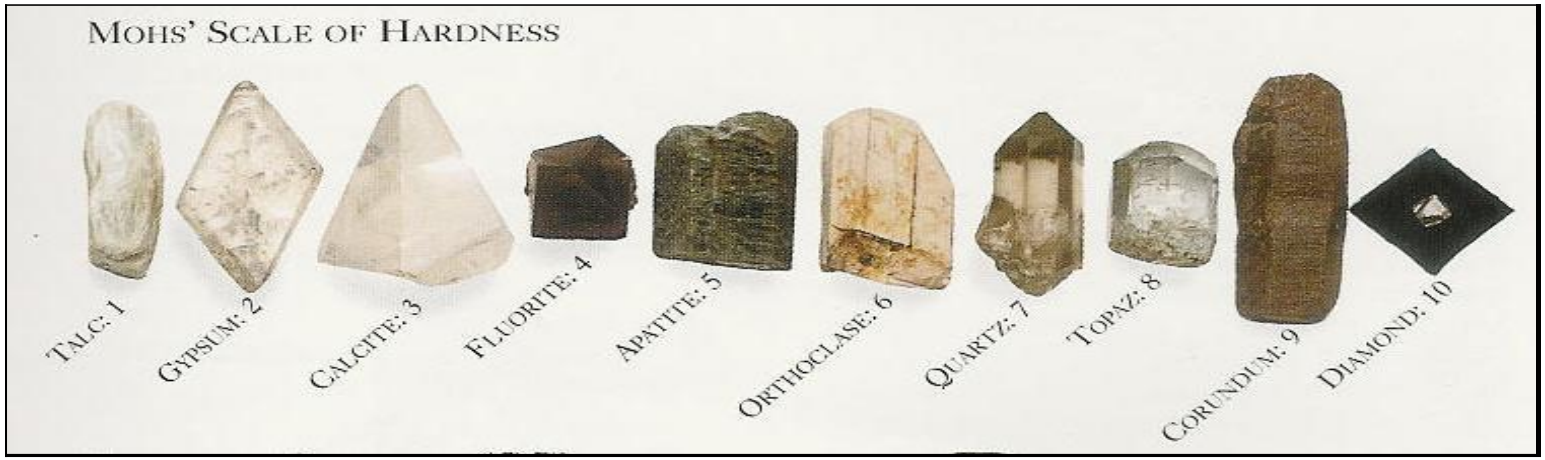
- The hardness of a **mineral** depends upon how strongly the atoms are bonded and packed within that mineral's crystal structure**.**

For example:

- The carbon atoms in diamonds have a very strong bond, making diamond the hardest mineral (10) on the Mohs hardness scale.
- Pyrite is hard (6 on Mohs scale); gold is soft (3 on Mohs scale).

Takeaway: A simple hardness test can keep you from being “fooled.”

Mohs Scale of Hardness

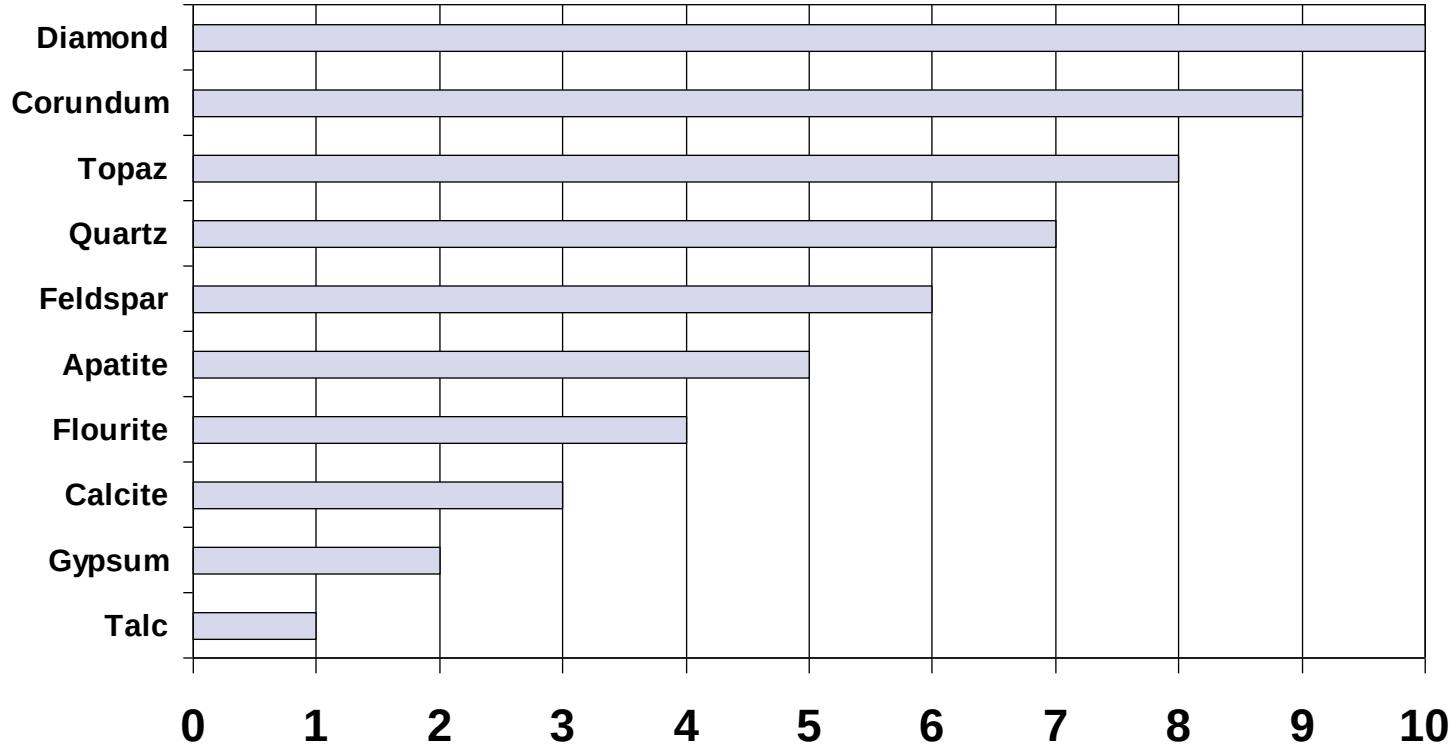


This scale was established in 1812 by the German mineralogist Friedrich Mohs, using 10 common minerals, from talc (1) to diamond (10).

Another way to think about it:

Fingernail:	2
Copper penny:	3
Steel knife:	4
Glass plate:	5 ½
Steel file:	6 ½

Mohs Scale of Hardness



Check Your Answers…

Number	Color	Streak	Name	What else?
1 	Black/Gray	Red/Brown	Hematite	Heavy/shiny Hardness +5
2 	Gold/Silver	Gray/Black	Pyrite	Shiny/hard Hardness +5
3 	Yellow	Yellow/White	Sulfur	Stinky/crumbly Hardness -5
4 	Silver/Gray	Black/Gray	Galena	Metal/shiny/hard Hardness -5
5 	White/Clear	White	Quartz	Shiny/translucent Hardness +5
6 	Gold/Orange	White/Clear	Calcite	Shiny/translucent Hardness -5

Congratulations!

You rock as a mineralogist!