



MINERALS

Activity #2 - Mohs Hardness Test

Recommended for grades 3-6. Activity can be completed inside or outside. Adult supervision is recommended.

Purpose: To determine the hardness of a mineral sample using the Mohs hardness scale. By knowing how hard a mineral is you can make an educated guess on the type of mineral it is. This test compares the resistance of a mineral to being scratched by a material of known hardness (*these can be other minerals or materials such as copper or glass*).

Materials:

- 5 different samples of minerals
- Toothbrush and some water (*to clean dirt and debris off samples*)
- Copper penny/piece of copper tube (*pennies before 1982 are copper, anything before that are not*)
- Piece of glass/tile (*you can use duct tape to cover any sharp edges to make it safer*)
- Steel nail/file
- Paper clip
- Fingernail (*one that is still attached to your hand will do just fine 😊*)

How it Works:

Context: All minerals can be put on a scale from 1-10(Mohs scale) based on how hard the mineral is. This is done by scratching an item or mineral of known hardness on a mineral of unknown hardness to see if it leaves a scratch. If the item or mineral of known hardness leaves a scratch it means that the unknown mineral is softer.

The Mohs scale of minerals and household items are shown in the diagrams below:

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

Mohs Hardness of Common Objects	
fingernail	2 to 2.5
copper	3
nail	4
glass	5.5
knife blade	5 to 6.5
steel file	6.5
streak plate	6.5 to 7
quartz	7

FIGURE 12.1. Mohs Scale of Hardness

Step 1: Allow students time to collect 5 different minerals

Step 2: Clean off mineral samples using a toothbrush and some water and number your samples from 1-5.

Step 3: Copy the chart out below on a piece of paper (*1 per student*)

<i>Put a mark under the item that can scratch the sample</i>	Fingernail	Copper	Paper clip	Glass/ pocketknife	Steel nail/file	What mineral could it be?
1						
2						
3						
4						
5						

Step 4: Test each sample starting with the **softest** household item, working your way through the items until your sample can be scratched. (*if you have samples of minerals that you know what they are and have a known hardness like talc, apatite or diamond, you can also use these to determine the harness of your unknown minerals.*)

Step 5: Record your findings as you go. Based on the item that was able to scratch your sample, can you guess what type of mineral you have by looking at the Mohs scale? Fill in the last column of the chart.

Conclusion:

Not only does knowing the hardness of minerals help us to identify them, Hardness can also help us to understand how they can be manipulated therefore allowing people to find uses for them.

For example: Calcite is a popular mineral found around the Kingston and Frontenac areas and has many uses such as:

- Antacids for indigestion
- As an acid neutralizer
- As a sorbent (*captures or absorbs other things*) Calcium carbonate reacts with sulfur dioxide and other gases in the combustion emissions, absorbs them, and prevents them from escaping to the atmosphere.
- Used to make monuments and statues
- Cleaning products
- Production of cement and concrete

Also, now that you have figured out the hardness of your samples, **try out the other 3 activities** to see if you can identify the type of minerals you have. The other activities are:

- Minerals 3 - Luster
- Minerals 4 - Breakage
- Minerals 5 – Streak test

Resources:

Watch this video!

https://www.youtube.com/watch?time_continue=269&v=2eQZsn_bmDI&feature=emb_logo