

MINERALS NOTES



AGATE



AMETHYST



CHALCOPYRITE



HEMATITE



CHALCEDONY



SHALE



BAUXITE



BERYL



KYANITE



QUARTZ



MAGNETITE



MICA



GALENA



HALITE



CALCITE



GARNET



AZURITE



OBESIDIAN

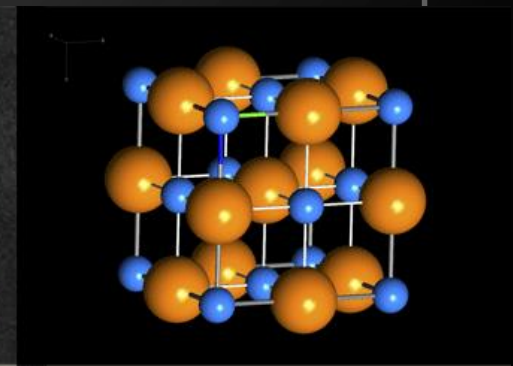
MINERALS . . .

- are NOT rocks!
- Elements make minerals.
- Minerals make rocks.



MINERAL CHARACTERISTICS

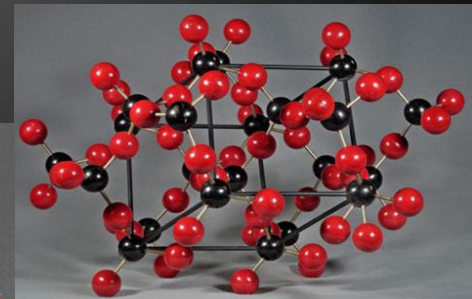
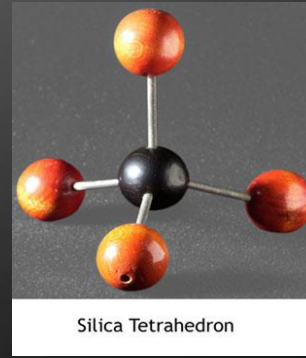
- Solid
- Form naturally
- Inorganic (not from living organisms)
- Definite chemical formula
(i.e. quartz is SiO_2)
- Crystalline structure



COMMON MINERAL GROUPS

- **Silicates**

- Made of oxygen and silicon
- Most common mineral group
- Example: quartz



Crystal Structure of Quartz



COMMON MINERAL GROUPS



- **Carbonates**

- Made of a metal and carbonate (CO_3)
- Example: calcite

- **Oxides**

- Made of a metal and oxygen
- Example: Hematite



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MINERAL IDENTIFICATION: COLOR

- IS the exterior (outside) color of a sample
- **TESTED** by visual examination (i.e. by looking at it)
- Easiest property to test
- Least useful property for identification
 - Many different minerals have the same color
 - The same type of mineral can be many different colors



MINERAL IDENTIFICATION: LUSTER

- IS the way a mineral reflects light/shines
- TESTED BY visual examination of the mineral in the light
- SOME options for luster include:

<u>Metallic</u>	<u>Transparent</u>	Nonmetallic Lusters			
<u>Dull</u>	<u>Pearly</u>	 Pearly	 Vitreous	 Resinous	 Silky
<u>Earthy</u>	<u>Greasy</u>	 Greasy	 Adamantine	 Dull	 Waxy
<u>Vitreous</u>	<u>Glassy</u>				

MINERAL IDENTIFICATION: TEXTURE

- IS how the exterior feels
- TESTED BY rubbing fingers on it



MINERAL IDENTIFICATION: STREAK

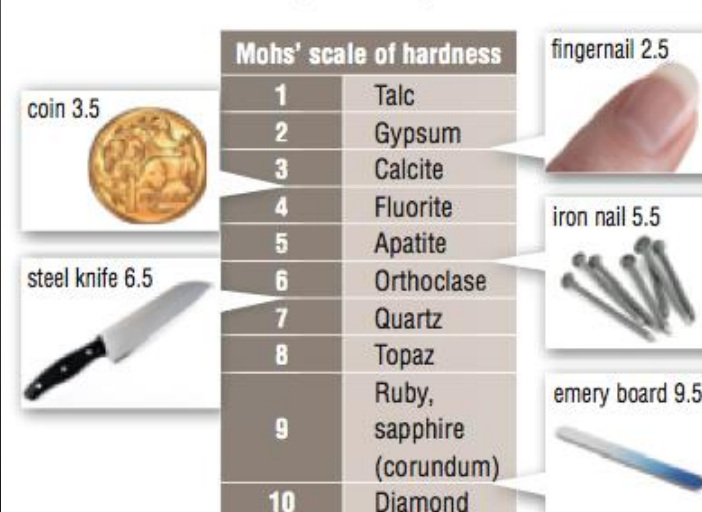
- IS the color of the mineral when powdered
- TESTED BY dragging the mineral on a streak plate
 - 2 streak plates (1 light, 1 dark)
 - Check each mineral on both—the exterior color may be dark but the streak light



MINERAL IDENTIFICATION: HARDNESS

- IS its ability to resist scratching (i.e. how hard the surface is)
- TESTED BY ranking on Mohs Hardness Scale (0-10) by trying to scratch it with several items:

- 1st: Fingernail
- 2nd: Penny and/or nail
- 3rd: Mineral scratches glass slide



The chart displays the Mohs' scale of hardness from 1 to 10. To the left of the scale are images of objects used for testing: a coin (3.5), a steel knife (6.5), and a fingernail (2.5). To the right are images of other objects: an iron nail (5.5) and an emery board (9.5). Lines connect these objects to their respective hardness values on the scale.

Mohs' scale of hardness	
1	Talc
2	Gypsum
3	Calcite
4	Fluorite
5	Apatite
6	Orthoclase
7	Quartz
8	Topaz
9	Ruby, sapphire (corundum)
10	Diamond

coin 3.5

steel knife 6.5

fingernail 2.5

iron nail 5.5

emery board 9.5

MINERAL IDENTIFICATION: HARDNESS



TESTED BY ranking on Mohs Hardness Scale :

- **Step 1: Try to scratch mineral with fingernail**
 - If fingernail scratches the mineral, hardness is less than 2.5
- **Step 2: IF the fingernail did not scratch it, try the penny and nail**
 - If penny or nail scratches the mineral, hardness is between 2.5 & 6.0
- **Step 3: . . .**



MINERAL IDENTIFICATION: HARDNESS



TESTED BY ranking on *Mohs Hardness Scale* :

- **Step 3:** IF the fingernail, penny, and nail did **NOT** scratch it, the mineral **MUST** be able to scratch the glass slide—try to scratch the slide with the mineral
 - If mineral scratches glass, hardness is greater than 6.0
 - If the mineral does not scratch the glass, try again from **Step 1**—you missed something!

MINERAL IDENTIFICATION: CLEAVAGE

- IS the breaking of a mineral along smooth planes (makes a pattern . . . blocky, prism, conchoidal, etc.
- **TESTED BY** visual examination of the broken edges
 - **Good:** shows a patterned breakage
 - **Poor:** shows no pattern to the breakage



MINERAL IDENTIFICATION: FRACTURE

- IS the rough, jagged, unpatterned breakage of the mineral
- TESTED BY visual examination of the broken edges
 - Rough: shows jagged points with no patterning
 - Smooth: shows flat edges and sides based on the cleavage pattern



MINERAL IDENTIFICATION: DENSITY

- IS the compactness of the atoms of the object as expressed by a ratio of the mass to the volume
- TESTED BY ...
 - Mass: triple-beam or electronic balance
 - Volume: water displacement technique
 - Density: calculate
(density = mass/volume)

MINERAL IDENTIFICATION

