

What is a Mineral?

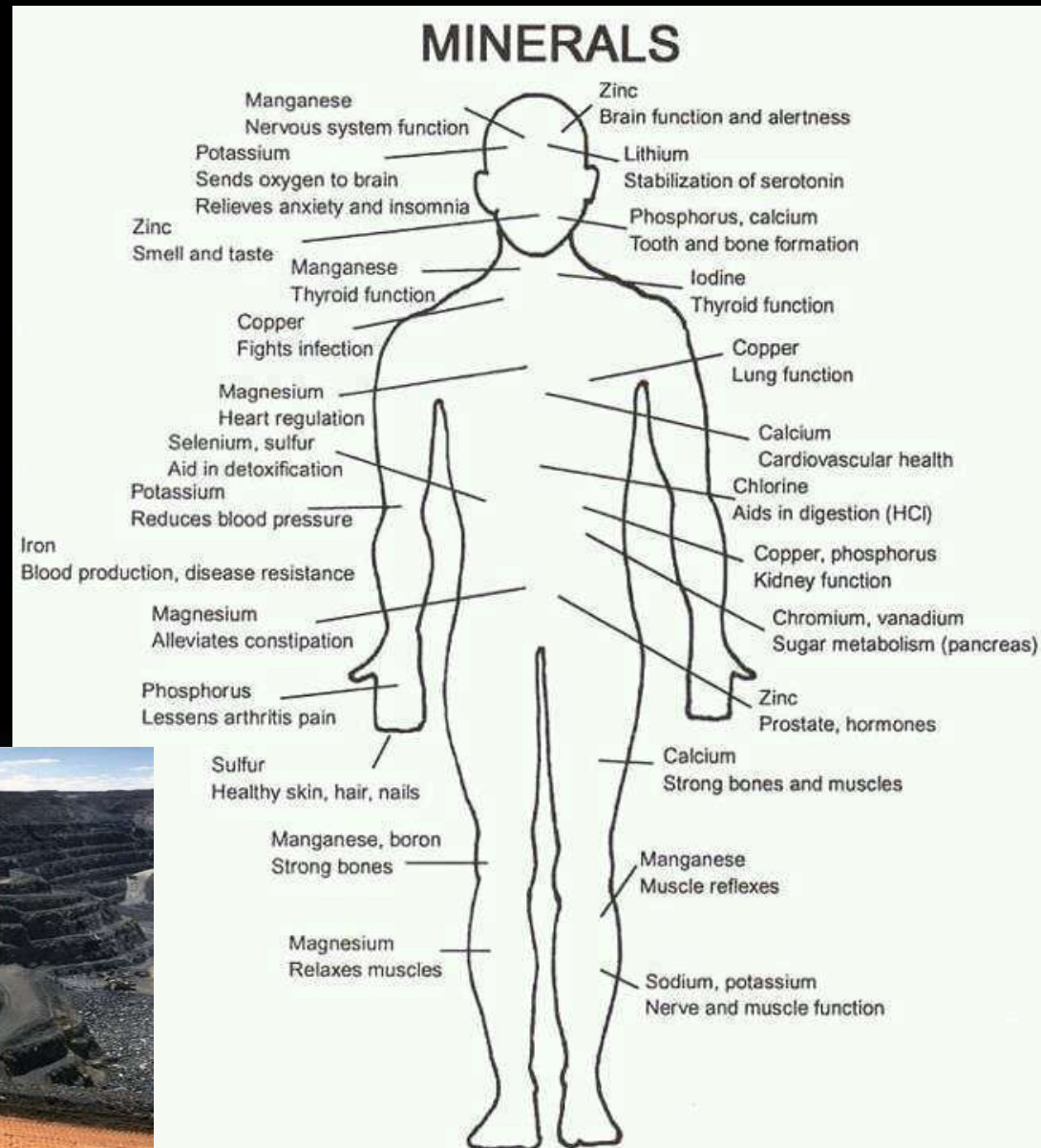
- A naturally occurring, inorganic solid that has a crystal structure & a definite chemical composition.

- Example: Quartz



Naturally Occurring:

- Found in nature
- Not man-made
- Forms underground



Inorganic Solid:

- Means the mineral *cannot* come from things that were once living
- Not a liquid or gas
- Non Example: Coal – it is organic because it comes from plants that lived millions of years ago.

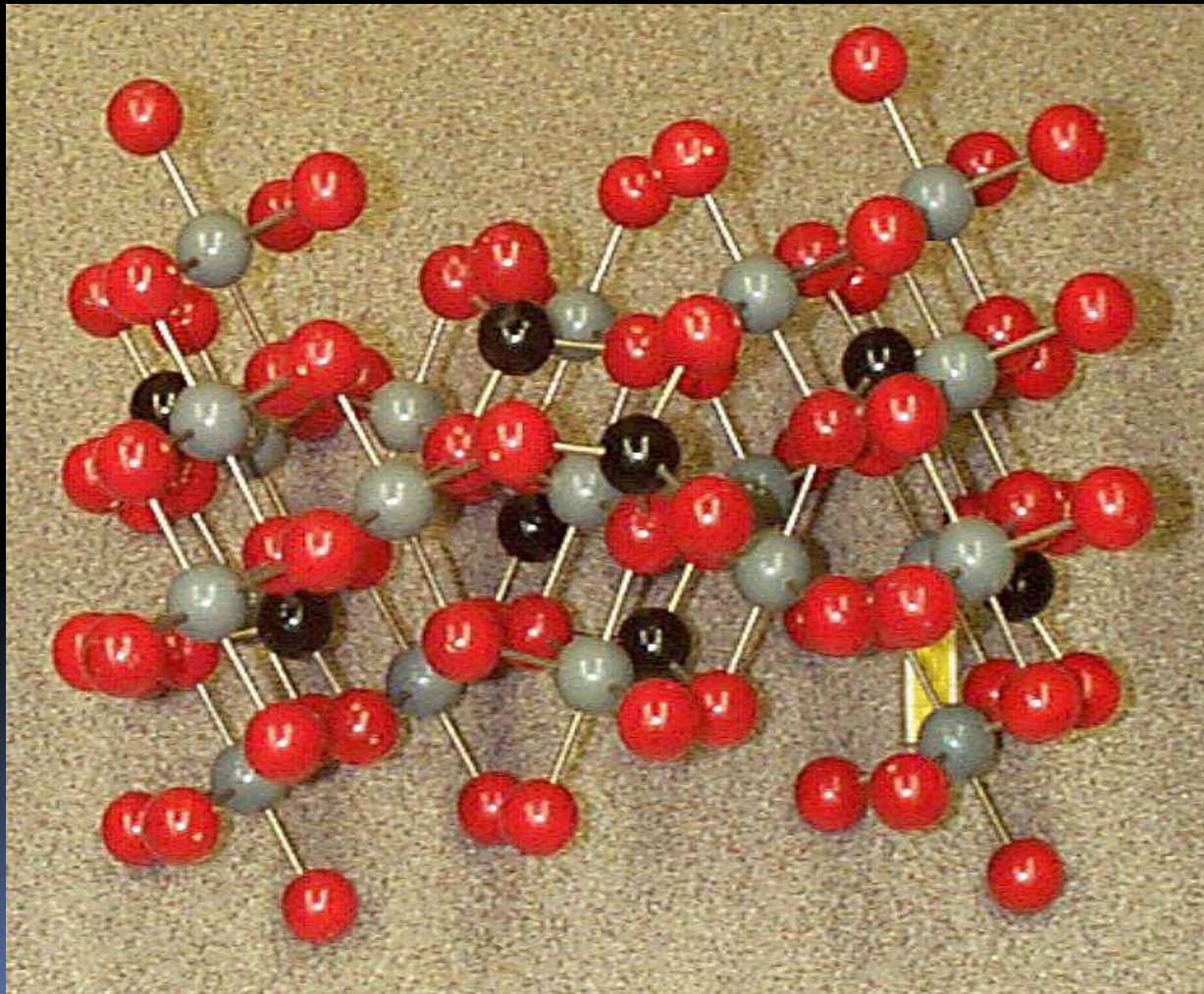




Crystal Structure:

- The repeating pattern of a mineral's particles that line up when they form.
 - Looks like rock candy.
 - There are 6 different crystal systems. They are categorized by the # & the angle of the crystal faces
- 

Crystal structures look like...



6 Different Crystal Systems:

- Cubic Ex: Magnetite
- Hexagonal Ex: Quartz
- Tetragonal Ex: Rutile
- Orthorhombic Ex: Sulfur
- Monoclinic Ex: Azurite
- Triclinic Ex: Microcline Feldspar

Some examples of the crystals:

Magnetite →



Sulfur →



Rutile →



Azurite →





So what if you don't know which mineral you have?

- There “tests” you can perform on minerals to see what type of mineral they might be.



Physical Properties

Identify Minerals. We will learn 6...

1. Streak Test



- The color of the mineral's powder that's left behind when it is rubbed across a rough surface.
- Ex: Pyrite looks like gold but, it's streak looks greenish-black (aka "fool's gold")
- Writing with your pencil in class = graphite!

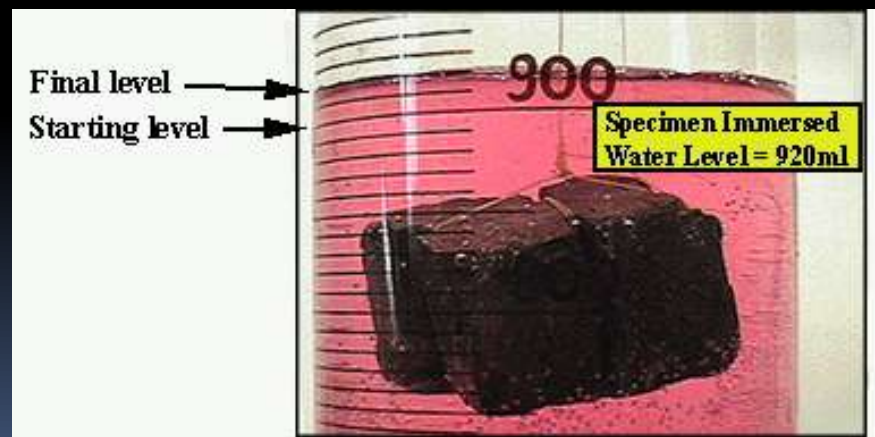
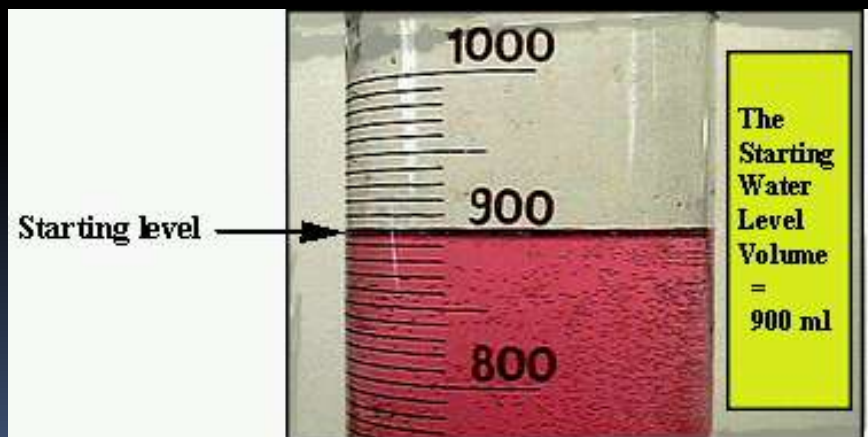
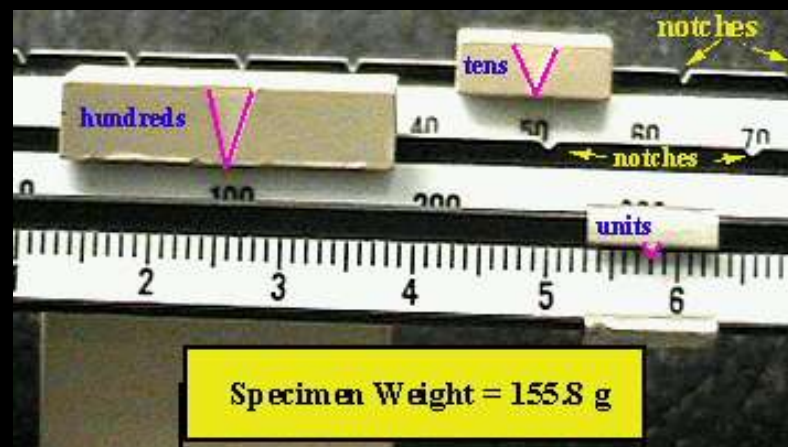
2. Luster



- Describes how light is reflected from the mineral's surface. What does it look like?
- Types of luster:
 - MetallicEx: Galena
 - GlassyEx: Topaz
 - Waxy, Greasy, PearlyEx: Talc
 - DullEx: Graphite
 - SilkyEx: Malachite
 - EarthyEx: Hematite

3. Density

- It's a calculation (math problem!)
 - Use a balance to find the mass.
 - Place the mineral in H₂O to find the amount of water it displaces. This amount is the volume of the mineral.
 - To find the density, divide mass by volume.
 - Ex: Sample of Olivine
 - Mass = 237 g Volume = 72 cm³
 - Density = $237 \text{ g} / 72 \text{ cm}^3 = 3.3 \text{ g/cm}^3$



4. Cleavage

- One way minerals break
- Easily split along flat surfaces

■ Ex: Mica & Feldspar



5. Fracture

- One way minerals break
- Break unevenly in irregular ways
 - Chipped
 - Shell-likeEx: Quartz
 - Jagged pointsEx: Copper & Iron
 - CrumblesEx: Clay



6. Mohs Hardness Scale

- A scale that ranks 10 minerals from softest to hardest. You can compare unknown minerals to the minerals on this scale.
 - Hardness can be tested by a Scratch Test
 - A mineral can scratch any other softer mineral
 - It can also BE scratched by any harder mineral
- Softest Mineral = Talc
- Hardest Mineral = Diamond

MOHS HARDNESS SCALE



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1 TALC



2 GYPSUM

← *FINGERNAIL*



3 CALCITE

← *COPPER COIN*



4 FLUORITE



5 APATITE

← *KNIFE / GLASS*



6 FELDSPAR

← *STEEL*



7 QUARTZ



8 TOPAZ



9 CORUNDUM



10 DIAMOND

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Some other common uses:

