#### **Mineral Properties**

- Each Mineral has properties. These depend on:
  - 1. The type of minerals present
  - 2. The arrangement of atoms
  - 3. The strength of bonding

Reference: p 21 - 24

#### List of properties used to identify minerals:

- 1. Specific Gravity
- 2. Hardness
- 3. Cleavage
- 4. Streak
- 5. Lustre
- 6. Color
- 7. Other Taste, feel, magnetism, acid test, fluorescence

#### Hardness

- The resistance of a mineral to scratching
- Hardness is expressed in terms of Moh's Hardness
  Scale which ranks relative hardness from 1 10.
- You could use a rhyme to remember the hardness scale:
  <u>Mohs Hardness Scale</u>

Tonight Gypsies Come From Africa On Quads To Catch Dinosaurs



- The following objects can be used when trying to determine the hardness of different minerals.
- If the object scratches the mineral then it is harder than the mineral.



Approximate Hardness of Common Objects	
Fingernail	2.5
Copper penny	3.5
Iron nail	4.5
Glass	5.5
Steel file	6.5

#### Nail, hardness of 4.5 scratches a mineral.





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## Cleavage

- The tendency of some minerals to break along smooth, flat, parallel surfaces.
- Cleavage directions are determined by atomic structure and strength of bonding.



#### Cleavage follows areas of weak bonding.



# **Cleavage Plane Directions**

- Minerals show cleavage in many different directions, but most common are in planes of one, two, and three directions.
- Cleavage in one direction (Basal Cleavage).
- Example: Mica displays this type of cleavage.



Because of weak bonds, mica splits easily between "sandwiches"

Positive ions, sandwiched between two sheet silicate layers



- Cleavage in two directions.
- Example: Orthoclase feldspar displays this type of cleavage.



Two planes of cleavage



- Cleavage in three directions.
- Example: Halite displays this type of cleavage.





### Fracture

- A mineral that do not have any cleavage planes is said to break by <u>"Fracture"</u>.
- Example is glass or the mineral quartz which is said to have <u>Conchoidal Fracture</u>.



 Another example of a mineral that fractures is Asbestos. This mineral displays a <u>Fibrous</u> <u>Fracture</u>.

