Warm-up 4/16

page: 111, 1. Why is coal not a mineral?

It is organic – made from plant material

Page: 111, 2. Volcanic glass is known as _____.

Obsidian

Page: 112, 3. Earth Scientist have identified more than _____ minerals.

4000

Warm-up 4/17

Page: 114, 1. All minerals in the Earth have a _____ structure.

crystal

Page: 114, 2. Knowing the crystal shapes is helpful in _____ minerals.

identifying

Page: 114, 3. One way that scientist study the structure of crystals is by using _____.

X-rays

Objectives: S.W.B.A.T.

- Discuss formations of minerals
- Explain two ways minerals form
- Define: magma, lava, geode
- Explain how cooling rate effects crystal growth
- Relate mineral groups to the elements or compound that they are made from
- State the two main elements that make up 75% of the Earth's crust
- Understand saftey when working with chemicals – wear goggles and gloves

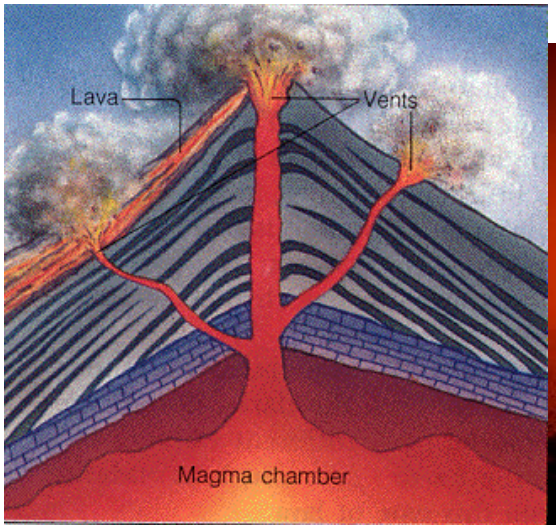
Activites:

- Warm-up and quiz
- Notes/discussion – observation demonstrations
- Lab introduction - microcrystals

Mineral Formation

Most minerals form deep within the ground from **Magma**.

Magma- is molten or hot liquid rock beneath the Earth's surface if it reaches the surface it is called **Lava**

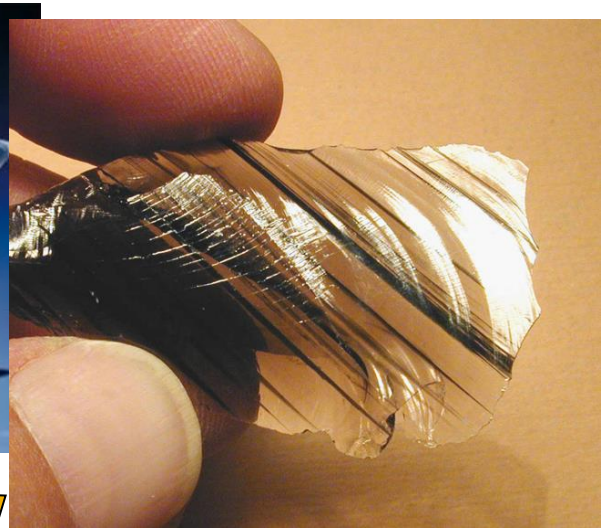


Volcanoe demo

- https://www.youtube.com/watch?v=Ula2NWi3Q34

When magma cools, it hardens to produce crystals

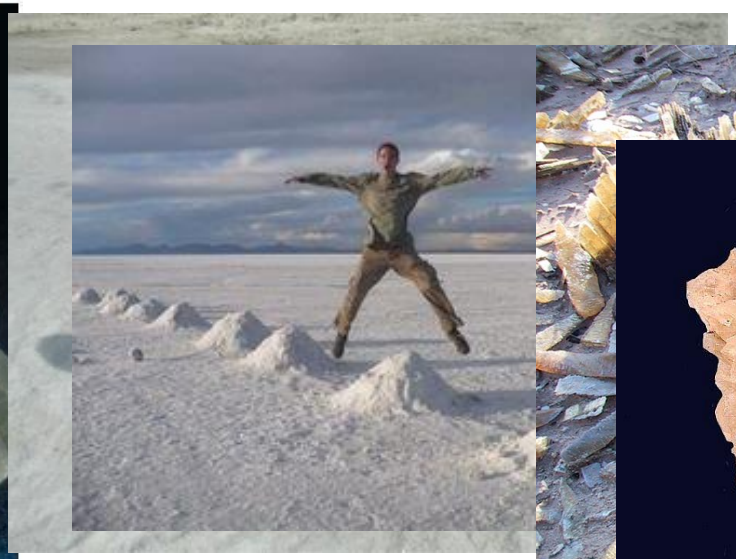
- Slow cooling produces large crystals



- Fast cooling produces very little crystals or no crystals at all (which may form glass)

Solutions

2. Minerals can also be produced out of **Solutions** – the water containing dissolved minerals evaporates and mineral crystals are left behind. (**evaporates or halides**: halite, gypsum)

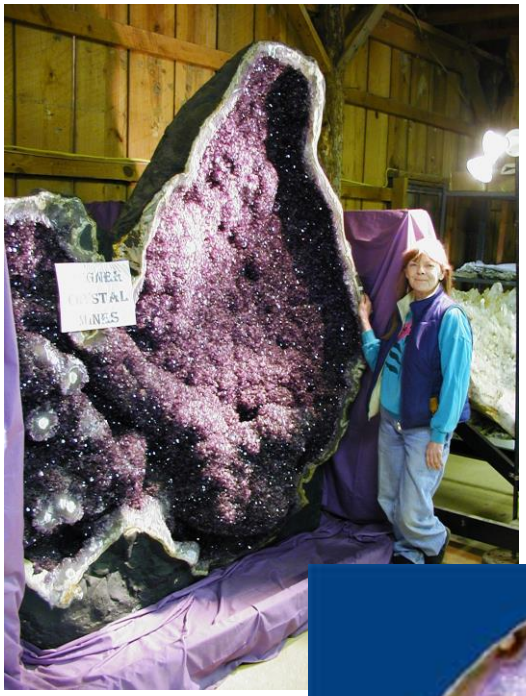


Hot Gases - condensing

3. Minerals can also be formed out of **hot gases** which condense and cool into crystals.

Geode – can form in this way, Means *hollow rock lined with crystals*, and are formed when hot gases or liquids rich in minerals are trapped in a pocket of a rock and cool.

More Geodes



Micro-crystal lab

- Using evaporation from a chemical solution to create crystals
- 7 slides # 1 to 7
- **Wear goggles and gloves !!**
- Place drop of correct chemical on numbered slide ***(do not mix chemical it makes a mess)***
- Place slides in location so it does not get disturbed
- Work on question until end of period

Cool down

1. Most minerals form from : _____

Magma/lava

2. Some minerals can form out of a solution that _____ leaving the mineral behind.

evaporates

Cool down

1. What does synthetic mean?

Man-made

2. Most minerals form from (name two processes or ways):

Magma or lava, evaporation from solution, condensation from hot gases

Warm-up

Activities

- Warm-up
- Finish micro-crystal lab
- What is a mineral 1-4 worksheet

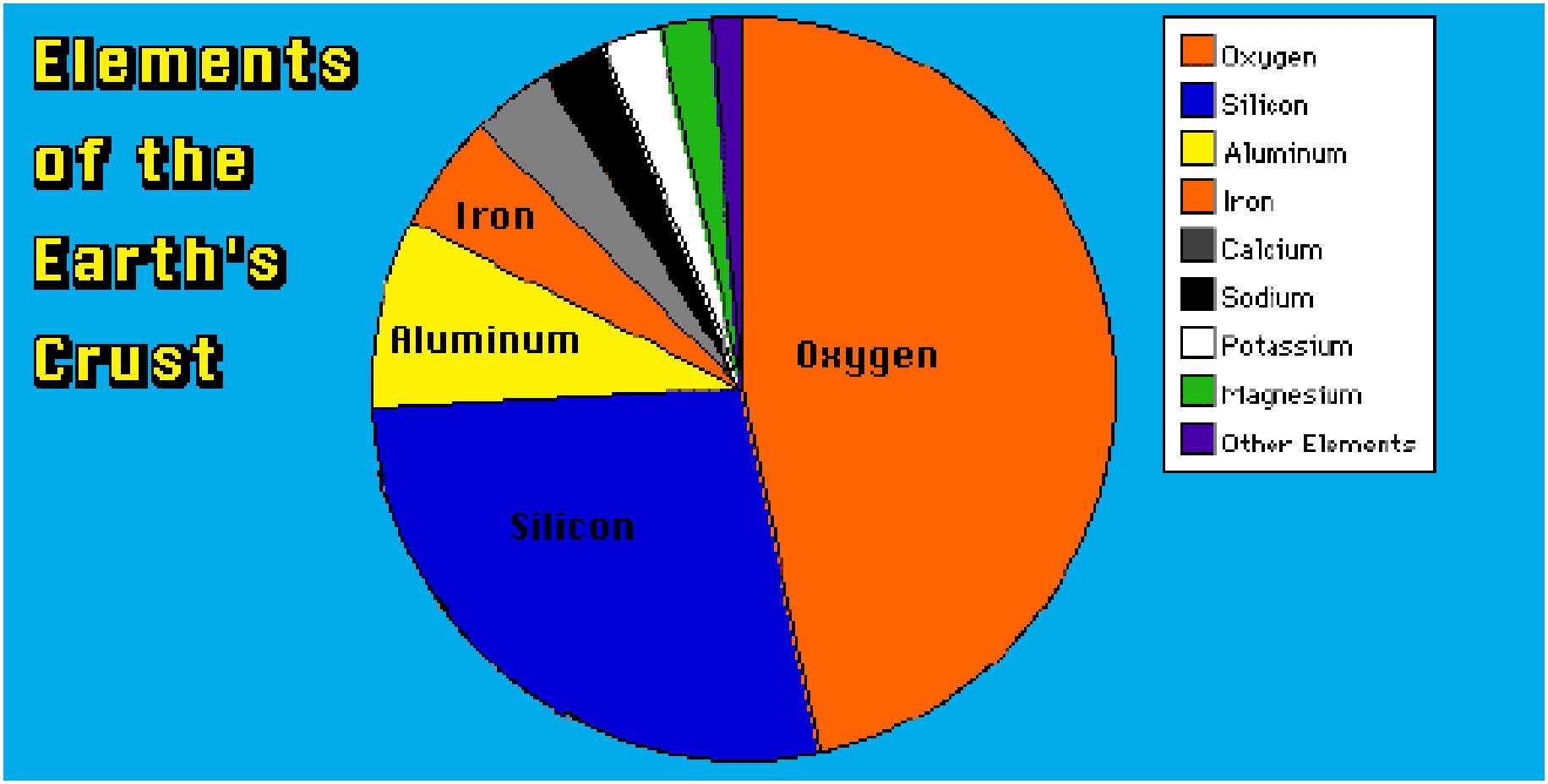
Classification of minerals

Mineral Composition & Groups:

MINERAL COMPOSITION & GROUPS

Out of the **4000** known minerals only **8 elements** make up all most of each of them. *(called Rock forming minerals)*

Elements in the crust



Mineral Composition & Groups:

Elements in the Crust:

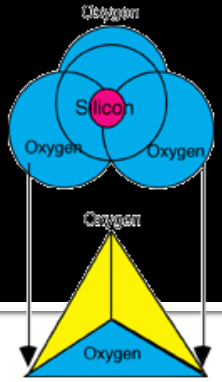
Oxygen = 46.6%	Silicon = 27.7
Aluminum = 8.1 %	Calcium = 3.6%
Iron = 5%	Potassium = 2.6%
Sodium = 2.8%	Other = 1.5%
Magnesium = 2.1%	

Mineral Groups:

MINERAL GROUPS

1. **Native Elements:** minerals made up of only one element
   example: gold, silver, sulfur, diamond.

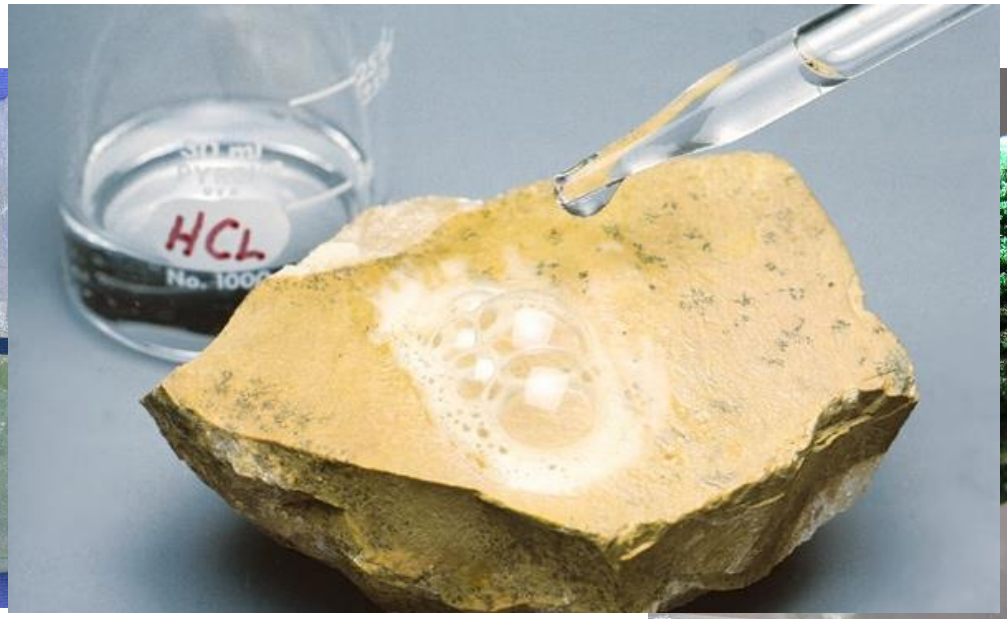
Mineral Groups:



2. **Silicates:** *most abundant* mineral groups, make up 75% of earth's crust. Contain silicon & oxygen.
   Example: quartz, mica, feldspar.

3. **Carbonates**- minerals that contain calcium carbonate ($CaCO_3$). Minerals bubble when tested by weak acids.

Examples: calcite, malachite



4. **Halides or *(Evaporites):*** Minerals that form from evaporation out of a solution, mostly salt type minerals.

Example: halite, fluorite, gypsum

others

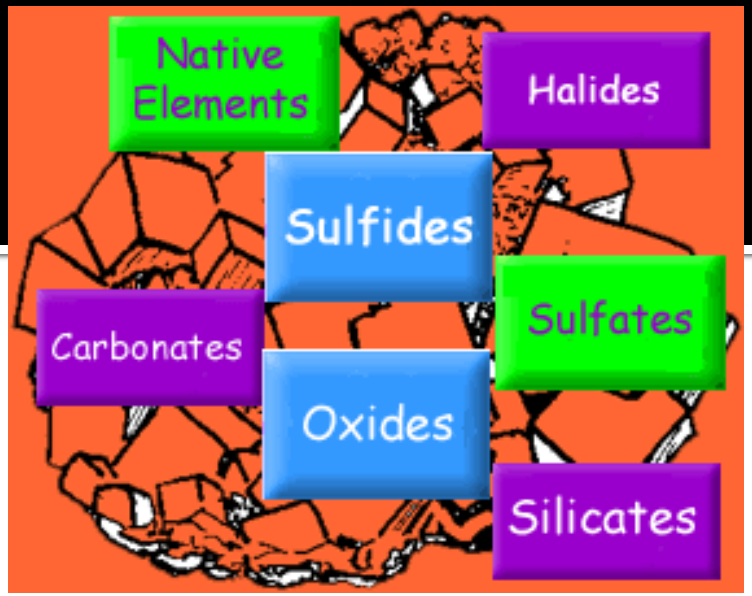
5. **Sulfides**: galena PbS, pyrite *"fools gold" FeS*

6. **Oxides**: Mostly metal and oxygen combined

Example: rubies, hematite

7. **Sulfates** contains compund: SO_4

Examples: Kalinite, Celestine


Native Elements
Halides
Sulfides
Sulfates
Carbonates
Oxides
Silicates


Element
Carbonate
Halide
Mineraloid
Oxide
Phosphate
Silicate
Sulfate
Sulfide

Cool down