Name: _____

Date: _____ Period: _____

Packet: Minerals

CLASS NOTES

- <u>Rock</u> - any naturally formed solid that is part of Earth or any other celestial object

    - Minerals are the _____ needed to form the different types of rocks

- <u>Mineral</u> - most geologist define a "mineral" as:

    1. _____

    2. _____

    3. _____

    4. _____

    5. _____

- Minerals form in the following manners:

    1. Precipitation from evaporating seawater

    2. Crystallization around cooling magma

    3. Under extreme heat and pressure [recrystallization]

    4. From hydrothermal solutions flowing through ground cracks

- Most rock forming minerals are silicates that result in a tetrahedron shape

    - Four-sided units of 4 _____ and 1 _____
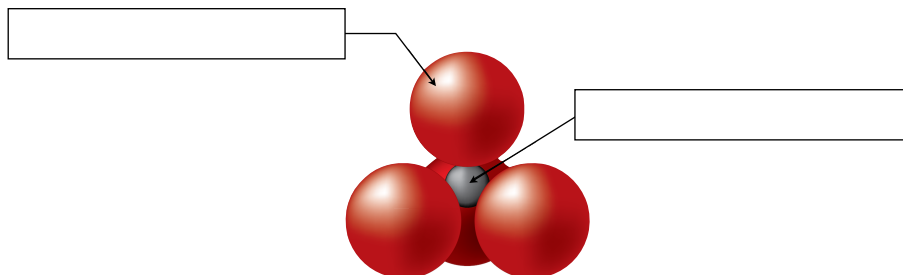
Packet: Minerals

- Physical and chemical properties of a minerals are determined by the:

- Each mineral has a set of physical and chemical properties that can be used to identify the sample

- The following methods are used to classify minerals:

  1. <u>Color</u> - a visual attribute of an object based on perception

     - One of the most obvious, but not the most reliable

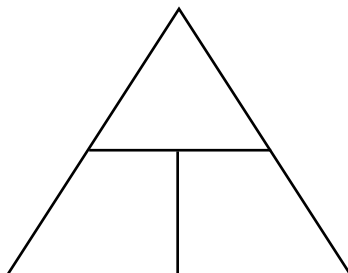   - Many of the _____ known minerals share similar colors

  2. <u>Streak</u> - _____
     _____

     - Weathering changes the outside color, but streak gives the true color

  3. <u>Luster</u> - _____
     _____

     - Two types of luster:

       - Metallic Luster - shines like stainless steel

       - Nonmetallic Luster - earthy or dull shine

  4. <u>Density</u> - _____
     _____

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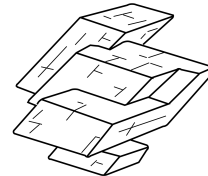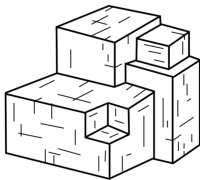- Methods used to classify minerals [continued]:

5. <u>Hardness</u> - _____

_____

- Mohs Hardness Scale is used to classify hardness

Hardness	Mineral	Test
1	Talc	Finger nail scratches easily
2	Gypsum	Finger nail scratches
3	Calcite	Copper penny scratches
4	Fluorite	Steel knife scratches easily
5	Apatite	Steel knife scratches
6	Feldspar	Steel knife will not scratches
7	Quartz	Will scratch glass and steel
8	Topaz	Harder then any common mineral
9	Corundum	Scratches topaz
10	Diamond	Hardest mineral

6. <u>Cleavage</u> - _____

_____

- Example: _____

Cleavage Examples

- Methods used to classify minerals [continued]:

7. <u>Fracture</u> - _____

_____

- Example: _____

Fracture Examples

8. <u>Acid Test</u> - when hydrochloric [HCl] acid is placed on a mineral it can effervesce [bubble]

- Example: _____

9. <u>Magnetism</u> - when a mineral is attracted to a magnet

- Example: _____

10. <u>Fluorescence</u> - when a mineral glows under ultraviolet light

- Example: _____

11. <u>Taste</u> - when a mineral tastes salty

- Example: _____

12. <u>Smell</u> - when a mineral exhibits a distinctive smell

- Example: _____

13. <u>Radioactivity</u> - some minerals gives off radiation that can be measured with Geiger counter

- Example: _____

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PART I QUESTIONS: MULTIPLE CHOICE

1. Which common nonmetallic mineral has a white-yellow streak?
    a. graphite
    b. calcite
    c. sulfur
    d. dolomite

2. The mineral mica breaks evenly along flat sheets mainly because of its
    a. density
    b. chemical composition
    c. atomic arrangement
    d. hardness

3. Which mineral has nonmetallic luster, exhibits cleavage, and feels greasy?
    a. halite
    b. gypsum
    c. talc
    d. olivine

4. Which property is most useful in mineral identification?
    a. size
    b. color
    c. texture
    d. hardness

5. Certain minerals usually break along flat surfaces, while other minerals break unevenly. This characteristic is due to the
    a. luster of the mineral
    b. age of the mineral
    c. force with which the mineral is broken
    d. internal arrangement of the mineral's atoms

6. The physical properties of a mineral are largely due to its
    a. internal arrangement of atoms
    b. volume
    c. organic composition
    d. melting point

7. Which element combines with silicon to form the tetrahedral structure of the silicate minerals?
    a. nitrogen
    b. potassium
    c. hydrogen
    d. oxygen

8. Quartz mineral samples are best identified by their
    a. hardness
    b. color
    c. size
    d. mass

9. Which property is least useful in mineral identification?
    a. streak
    b. color
    c. luster
    d. hardness

10. Which property of a mineral most directly results from the internal arrangement of its atoms?
    a. volume
    b. color
    c. crystal shape
    d. streak

11. Which common minerals fizzes when dilute hydrochloric acid [HCl] is placed on it?
    a. calcite and feldspar
    b. feldspar and quartz
    c. quartz and dolomite
    d. calcite and dolomite

12. Which of the following minerals has metallic luster, silver color, black streak, and contains iron?
    a. graphite
    b. galena
    c. magnetite
    d. pyrite

13. The minerals talc, muscovite mica, quartz, and olivine are similar because they
    a. have the same hardness
    b. are the same color
    c. contain silicon and oxygen
    d. break along cleavage planes

14. Which mineral is commonly mined as a source of the element lead [Pb]?
    a. galena
    b. magnetite
    c. quartz
    d. gypsum

15. Which mineral will scratch fluorite, galena, and pyroxene?
    a. graphite
    b. calcite
    c. olivine
    d. dolomite

Packet: Minerals

For questions 16 through 19, use the table below that shows data for a student's collection of mineral samples A through I. For each mineral sample, the student recorded mass, volume and density. The density for rock D and the volume for rock B have been left blank.

Mineral	Mass [grams]	Volume [cm³]	Density [g/cm³]
A	82.9	34.4	2.41
B	114.2		2.68
C	144.7	63.2	2.29
D	159.4	59.7	
E	87.7	33.1	2.65
F	59.6	21.0	2.84
G	201.1	68.4	2.94
H	85.1	11.2	7.60
I	110.2	47.3	2.33

16. The approximate density of rock sample D is
    a. 2.75 g/cm³
    b. 3.75 g/cm³
    c. 3.32 g/cm³
    d. 2.67g/cm³

17. The approximate volume of rock sample B is
    a. 12.6 grams
    b. 22.0 grams
    c. 32.5 grams
    d. 42.6 grams

18. Based in the density data, what is the name of Mineral H?
    a. Graphite
    b. Sulfur
    c. Galena
    d. Quartz

19. The student broke rock G into two pieces. Compared to the density of the original rock, the density of one piece would most likely be?
    a. the same
    b. greater
    c. less