

# Mineral Properties

Name \_\_\_\_\_

Partner(s) \_\_\_\_\_

Class section \_\_\_\_\_ Date \_\_\_\_\_

Lab section \_\_\_\_\_

## Objective:

- 1) By the end of this exercise, students will be able to demonstrate knowledge of the standard properties used to identify minerals.
- 2) By the end of this exercise, the students will be able to identify many minerals by sight.

**Safety Precautions: Be sure not to taste any of these minerals unless specifically directed to do so by the teacher. Be sure to thoroughly wash your hands with soap and water after completing each day's lab work.**

## Procedure:

- 1) Define each of the following properties used to identify minerals:
  - a) color \_\_\_\_\_
  - b) streak \_\_\_\_\_
  - c) luster \_\_\_\_\_
  - d) hardness \_\_\_\_\_
  - e) cleavage \_\_\_\_\_
  - f) fracture \_\_\_\_\_
  
- 2) Following the instructions given you by the teacher, fill in the chart (found of the separate sheet) describing the way that the minerals in the chart demonstrate the properties listed.



## Finding the density of a mineral

1. Take small piece of apatite or garnet and do these steps in the order they are written.
  - a) write down the name of the mineral you have chosen: \_\_\_\_\_
  - b) use a triple beam balance to determine its mass to the nearest tenth of a gram.  
Mass = \_\_\_\_\_
2. Put some water into a graduated cylinder and record the volume of the water alone  
Volume of water alone \_\_\_\_\_
  - a) Add the piece of mineral to the water in the graduated cylinder. Read the volume  
Volume of mineral and water \_\_\_\_\_
  - b) Subtract the volume of the water from the combined volume of the mineral and the water. This will be the volume of the mineral by itself.  
Volume of mineral and water – volume of water alone = mineral alone

$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

3. Use the equation density = mass / volume to calculate the density of the mineral.

SHOW ALL WORK BELOW.

- a. write down equation
- b. substitute numbers
- c. calculate and write answer with proper units.

4. The actual density of apatite is \_\_\_\_\_ and garnet is \_\_\_\_\_. Use the percent deviation calculation to calculate how different your answer is to the “official” number.

$$\text{Percent deviation} = \frac{\text{difference from accepted value}}{\text{accepted value}} \times 100$$

- b. substitute numbers
- c. calculate the answer, the unit is %

5. The density of orthoclase feldspar is 2.6g/cm<sup>3</sup>. If you mass a piece of feldspar and find that its mass is 120.8g, you can calculate volume by using the equation  $d = m/v$  and manipulating it. Calculate volume. SHOW ALL WORK.

- a. write down equation
- b. substitute numbers
- c. calculate and write answer with proper units

6. The density of gypsum is  $2.4\text{g/cm}^3$ . If the volume is  $32.8\text{cm}^3$ , calculate the mass.

SHOW ALL WORK.

- a. write down equation
- b. substitute numbers
- c. calculate and write answer with proper units

**For Further Research:**

Go out to the internet, your textbook, the reference books in Room 140, the encyclopedias and other references in the Media Center, or other references to which you may have access and find out what at least five (5) of these minerals are used for. Tell what industrial, commercial, gemological, or other reason the five minerals you look up are important to human beings. In addition, find at least one (1) place where these minerals are found and list that information as well. **Do this on a separate sheet of paper which you will attach to this lab report.**

Special Prop?

<b>Mineral</b>	<b>Color</b>	<b>Streak</b>	<b>Luster</b>	<b>Hardness</b>	<b>Cleavage/Fracture</b>
<b>Augite/ Pyroxene</b>					
<b>Calcite</b>					
<b>Dolomite</b>					
<b>Feldspar/ Plagioclase/ Microcline</b>					
<b>Feldspar/ Orthoclase Pottasium</b>					
<b>Fluorite</b>					
<b>Galena</b>					
<b>Garnet/ Almadine</b>					
<b>Graphite</b>					
<b>Gypsum</b>					
<b>Halite</b>					

<b>Mineral</b>	<b>Color</b>	<b>Streak</b>	<b>Luster</b>	<b>Hardness</b>	<b>Cleavage/Fracture</b>
<b>Hematite</b>					
<b>Hornblende /Amphibole</b>					
<b>Kaolin</b>					
<b>Magnetite</b>					
<b>Mica/ Biotite or Muscovite</b>					
<b>Olivine</b>					
<b>Pyrite</b>					
<b>Quartz— Amethyst Citrine Tiger Eye</b>					
<b>Sulfur</b>					
<b>Talc</b>					

Note density of garnet = 3.5 g/cm<sup>3</sup>  
Apatite = 3.1 g/cm<sup>3</sup>