General Geology Lab #2: Minerals

Name_______________________________________

In today’s lab you will learn about Earth’s common minerals. Minerals are inorganic, naturally-occurring substances that have characteristic chemical composition, distinctive physical properties, and crystalline structures. More than 2,000 minerals have been identified, however only a small number are common and even fewer form most of the rocks on Earth. Today you will learn to identify some of the most common rock-forming minerals.

Mineral Properties

Color, Streak, Luster, Cleavage/Fracture, Density/Specific Gravity, Hardness

Mohs Hardness Scale

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Mohs Hardness</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talc</td>
<td>1</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
</tr>
<tr>
<td>Gypsum</td>
<td>2</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
</tr>
<tr>
<td>Calcite</td>
<td>3</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
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<tr>
<td>Fluorite</td>
<td>4</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
</tr>
<tr>
<td>Apatite</td>
<td>5</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
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<tr>
<td>Feldspar</td>
<td>6</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
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<tr>
<td>Quartz</td>
<td>7</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
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<tr>
<td>Topaz</td>
<td>8</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
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<tr>
<td>Corundum</td>
<td>9</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
</tr>
<tr>
<td>Diamond</td>
<td>10</td>
<td><img src="http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/" alt="Image" /></td>
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Picture Credit: http://umwgold.com/2013/05/03/basic-geology-stuff-you-may-want-to-know/

For each of the following questions, please refer to the lab station numbers. The samples in the first four stations are to be used to answer the following questions. These stations can be done in any order. The final station contains 12 “unknown” minerals that you must identify, using their properties. You should complete this station last.
Station #1: Crystal Habit

For the three minerals at this station, describe their crystal geometry (look at the lab books for reference) and sketch a three dimensional crystal.

1a) 

1b) 

1c) 

Station #2: Cleavage

For the three minerals, describe the cleavage/fracture quality (perfect, good, poor) and geometry (number of planes of cleavage and plane orientation):

2a) 

2b) 

2c) 

**Given the samples at station #1 and #2, how would you differentiate between crystal habit and cleavage?**
Station #3: Color & Luster

On a first order, the luster of a mineral is described as either 1) metallic or 2) non-metallic. However, within the “non-metallic” classification, minerals are further classified into:
Vitreous (like glass)
Splendent (like patent leather)
Resinous (similar to shiny plastic or hardened tree sap)
Adamantine (gem-like)
Greasy (like opal)
Waxy
Pearly
Silky
Dull/Earthy

***Classify the luster of each of the non-metallic minerals, based on the list above:

3a) 
3b) 
3c) 
3d) 
3e) 

Stations #4: Specific Gravity/Density

***List the samples in order of specific gravity (highest to lowest):

***What are two of main controlling factors for a mineral's density?
Station #5: Mineral Identification

For each of the unknown minerals, identify: 1) Name, 2) two properties that explain your identification, 3) the mineral’s chemical formula (where applicable), and the mineral group (i.e. sulfides, sulfates, phosphates, silicates, oxides, halides, etc.)

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Properties</th>
<th>Chemical Formula</th>
<th>Mineral Group</th>
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<tbody>
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</tbody>
</table>
9) Name___________________________
   Properties_______________________________________________________
   Chemical Formula_____________________ Mineral Group______________

10) Name___________________________
    Properties_______________________________________________________
    Chemical Formula_____________________ Mineral Group______________

11) Name___________________________
    Properties_______________________________________________________
    Chemical Formula_____________________ Mineral Group______________

12) Name___________________________
    Properties_______________________________________________________
    Chemical Formula_____________________ Mineral Group______________