LAB HOMEWORK ASSIGNMENT #1
Greene Gallery Tour / Mineral Use & Significance

This assignment is DUE:

Tuesday labs Wed. labs Thurs. labs Friday lab
Sept. 22 Sept. 23 Sept. 24 Sept. 25

This is a two-part assignment. Part 1 must be completed in the Thomas Greene Geological Gallery in Lapham 168 and your answers will be written (neatly) on this hard copy assignment. Part 2 requires you to conduct online research about your assigned or chosen mineral or rock, and submit your answers and descriptions in electronic format (e.g., Word file) to the ‘Geo Sci 100 ALL LABS’ D2L dropbox.

PART 1: GREENE GALLERY TOUR

OBJECTIVE: To introduce you to a museum-quality collection of rocks and minerals that will serve as a reference to you as you learn about minerals and rocks in lab.

DIRECTIONS: First, look around the Thomas Greene Geological Gallery to ‘orient yourself’, by locating the labels on the bottom right corner of each wall display case (labeled North, South, East or West), or the upper right corner of each floor display case (labeled 1-5). You will also notice that the minerals are primarily displayed on the east side of the Gallery and fossils are found on the west side of the Gallery. There are two displays (South-3 and 2-B) that focus on mineral properties and there are a few cabinets that exhibit many varieties of the same mineral (e.g., Display Case 2-A contains all calcite samples). You’ll also notice that the minerals on display are generally grouped into ‘classes’ that are readily identified by labels above each shelf (e.g., native elements, oxides, silicates,…) Once you have become familiar with the Gallery layout and display case labels, you will need to search the Gallery to answer the following questions. Notice that each question has a reference to a specific wall or floor display case to aid you in finding the answer. After you have completed your assignment, you MUST have your TA, a Gallery Staff attendant or Rob Graziano sign your assignment to verify that you did indeed go to the Gallery and do your own work. Finally, as you tour the Gallery, take notice of the variety and quality of these specimens, because we will ask you which mineral is your favorite at the end!

1. (East-1) There are 12 native elements exhibited on the top shelf. These mineral samples were found in nature as pure elements, not combined with other elements. List four of the 12 native elements on display. (NOTE: You will be assigned to research the uses and significance of one of these minerals for Part 2.)
   native element mineral ________________ native element mineral ________________
   native element mineral ________________ native element mineral ________________

2. (East-2) Identify the hydroxide mineral on the top shelf that is a major ore of aluminum. (Hint: it does not look like aluminum!)
   ____________________
3. (East-2) The mineral corundum (bottom shelf) is one of the hardest minerals, second only to diamond. That is why it is commonly used as an ___________ and its gem varieties (not on display, sorry!) are the common gemstones: ___________ and ___________. What is the hardness of corundum? _________ (Hint: Look it up in your lab manual, or locate it in South-3).

4. (East-2) The oxide mineral on the bottom shelf, left-of-center is a major ore of iron. It is displayed in its many varieties. Name this mineral. __________________________ This mineral, despite its many varieties, always exhibits the same streak color. The streak of a mineral is the color of the mineral in powdered form (e.g., as it is ‘streaked’ across a porcelain plate.) What is the streak color of this mineral? ________________ (Hint: Look it up in your lab manual, or locate the streak plates in Floor Display 2-B).

5. (East-3) Locate the colorful minerals malachite, azurite and aragonite. These minerals are among the same class of minerals as two common minerals that you will see often in lab, calcite and dolomite. Which class of minerals do these minerals, and calcite and dolomite, belong to? ________________________________

6. (East-4) Locate the minerals garnet, topaz, and zircon. You may know these minerals as gemstones, although these samples hardly look like gem varieties. Which class of minerals do these gemstone minerals belong to? ________________________________

7. (2-B) This floor display (in addition to Wall Display South-3) contains samples to illustrate the various mineral properties that are used to identify minerals (Note: This is a good display to study from!) One of the primary mineral properties you will study in lab is whether a mineral will fracture or ‘cleave’ along cleavage planes. Which common mineral on display in this floor cabinet exhibits two directions of cleavage at nearly 90°? ________________ Which mineral in this display exhibits three perfect (cubic) directions of cleavage? ________________ (Note: You use this mineral often at your dinner table, or to add ‘flavor’ to your food!)

8. (3-A) The gems opal, citrine and amethyst are all forms of what common mineral? __________

9. (3-D) Locate the display of the large fish fossil/reconstruction in this floor display cabinet. This fish was present in the Milwaukee area during the Devonian Period - about 400 million years ago! What was so unique about this Devonian-age fish? ________________________________

10. (South-4) What is the Wisconsin State rock? _________ State fossil? ________________________________

Thomas Greene’s collection, assembled in the late-1800s and early 1900’s, is actually comprised of more than 70,000 specimens, of which the majority are Silurian and Devonian-age fossils. (Obviously, they are not all on display!) Greene’s collection is often touted by many collectors as one of the best of its kind because of its unique and complete assemblage of local fossils, and unique minerals that are no longer available anywhere because of quarry locations that are closed or ‘mined out’. After visiting (and hopefully appreciating) Greene’s collection, please tell us which mineral on display is your favorite? and why? ________________________________

*To earn credit for Part 1 (to confirm that you did indeed visit the Gallery and do your own work) you need a signature of your TA, the Gallery attendant, or Rob Graziano here: ________________________________
PART 2: MINERAL USE & SIGNIFICANCE

OBJECTIVE: To research the practical or common use(s) of a select mineral, and describe its significance as a resource.

DIRECTIONS: Search at least two online references to identify the common uses and significance of your assigned mineral. Use your research findings to answer the questions below and submit your answers in electronic format (e.g., Word file) to the Geo 100 ALL LABS D2L site Dropbox.

BACKGROUND: Minerals and rocks are used in many everyday items. Often, the uses of minerals or rocks have changed or developed through time, so minerals or rocks that were significant years ago are not as useful today, while some minerals or rocks discovered more recently are extremely useful today. Another aspect of minerals and rocks that is often overlooked is that they are not globally abundant, instead many occur in limited geographic locations, making them even more valuable as a mineral resource. We could easily spend a whole lab lesson on mineral and rock uses or historical significance, but instead, we ask you in this assignment to research the location, abundance, use and significance of just one mineral. The unique mineral that you are to research and write about will be assigned by your TA.

Your specific assigned mineral or rock is ______________________

QUESTIONS:

1. (2 pts) Where can this mineral be found? (i.e., geographic setting) Has this mineral been found in Wisconsin? If yes, where? List at least three geographic locations where this mineral or rock is found (e.g., Vermont, China, England.). Has it been found in Wisconsin? If so, list what county or counties. See http://wisconsingeologicalsurvey.org/MinIndexIntro.htm

2. (3 pts) What are the uses of this mineral? List at least three uses of this mineral or rock. (e.g., it is used in electronics, building materials, …) You can Google ‘Uses of your mineral…’ or go to sites like this: http://www.mindat.org/

3. (3 pts) What is the significance of this mineral? Based on your research of where this mineral is found and how many uses there are for this mineral, explain in a short narrative (~1-2 paragraphs) how significant this mineral or rock is. (e.g., This mineral can be found in many locations around the world…and it was historically used for…and is currently used for… it is very common and found in many forms and geologic settings…consequently, this mineral is very important as a mineral resource…without it, we would not have, or not be able to…).

4. (2 pts) What references did you use to answer these questions? List at least two references (websites, books, journals, …) you used to complete this assignment.

ASSIGNMENT GUIDELINES:

- Your submittal should not exceed one page. 12-pt font and 1.5x line spacing is preferred.
- Your responses to questions 1, 2 & 4 do not need to be complete sentences – short answer or a bulleted list works just fine.
- Your response to question 3 should be a 1-2 paragraph narrative in your best technical writing. Your narrative should be clearly written, concise, organized and logical.
• **DO NOT SIMPLY CUT AND PASTE WEBSITE DESCRIPTIONS.** We can tell!! Instead, be sure to write your answers in your own words, and give credit to select websites or references that you use. *Wikipedia* does NOT count as a reference - that’s too easy!

• Your references must be ‘actual and accurate’. If we look up your references, but can’t find them, we can only assume that you directly copied the information from somewhere, or someone, so we simply give you a grade of ZERO!! No kidding!! (That’s called plagiarism, and it gets you in academic ‘trouble’!!)

• If you prefer not to type in the questions listed above, simply go to the Geo 100 course website, download this assignment, and cut and paste the Assignment Format section shown below into your Word file.

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**Assignment Format**

<table>
<thead>
<tr>
<th>Name:</th>
<th>________________</th>
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</thead>
<tbody>
<tr>
<td>Lab Section #:</td>
<td>________________</td>
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<tr>
<td>TAs’ name:</td>
<td>________________</td>
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<tr>
<td>Assigned mineral:</td>
<td>________________</td>
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1. This mineral is found in:

   This mineral has(hasn’t) been found in Wisconsin in:

2. This mineral is used for:

3. This mineral is significant because:

4. At least two references I used for my research include: