

Minerals and Rocks on the WWW

The World Wide Web (WWW) contains a tremendous amount of information pertaining to the study of Minerals and Rocks. For this and subsequent lab exercises you are encouraged to work in groups, but all work must be turned in on an individual basis.

In part I of the lab you are to use the WWW and **M&RCP Introduction and Ch 1 & 2**. In part II of the lab you are to investigate some other WWW sites that will directly support your labs and textbook materials throughout the semester.

First, prepare a word processor document in which you answer the questions presented in both parts I and II of this lab. You may cut and paste answers from the www sites but be sure that they make sense and are well written.

Part I

In lecture we will discuss both a “bottom up” as well as “top down” approach to the study of Minerals and Rocks. Working with a “top down” approach requires a review of some “big picture” material that should be familiar to you from previous Geology courses: A Synopsis of Plate Tectonic Theory

<http://csmres.jmu.edu/geollab/Fichter/PlateTect/synopsis.html>

The Structure of the Earth

<http://csmres.jmu.edu/geollab/Fichter/PlateTect/erthstru.html>

Lithosphere Structure

<http://csmres.jmu.edu/geollab/Fichter/PlateTect/earthlitho.html>

Plate Boundaries and Interplate Relationships

<http://csmres.jmu.edu/geollab/Fichter/PlateTect/plates.html>

Introduction to the Wilson Cycle

<http://csmres.jmu.edu/geollab/Fichter/PlateTect/wilsonintro.html>

These WWW sites can all be accessed from the home site for Plate tectonics created by Dr Lynn S. Fichter at James Madison University:

<http://csmres.jmu.edu/geollab/Fichter/PlateTect/index.html>

Material from **M&RCP Introduction and Ch 1 & 2** has been taken, in large part, from these www pages.

Questions (most answers are available from the above www sites)

1. Where do the processes that have resulted in the evolution of the earth take place (in a plate tectonic context) and what are these fundamental evolutionary processes?
2. What are the three types of plate boundaries and what happens at each of these areas?
3. Where do the processes that have resulted in the evolution of the earth take place (in a plate tectonic context) and what are these fundamental evolutionary processes?
4. Briefly describe a supercontinent cycle?
5. What is a brief history of the origin and evolution of the Earth from a planet with only ocean basin?
6. Name and briefly describe the rocks types found in each location:
 - a. Lithosphere: ocean basins and continents
 - b. Asthenosphere
 - c. Mantle (what is the difference between the mantle and the asthenosphere)
7. What is the difference between the mantle and the asthenosphere?
8. What are the 6 tectonic regimes that make up the lithosphere? Briefly describe each regime”.
9. In Dr Fichter’s opinion what is the “essence of plate tectonic theory”.
10. Distinguish between a deductive versus an inductive approach to understanding how the world works. Which is “bottom up”, which is “top down”?
11. Are theories ever abandoned? Why?
12. What is the value of the Wilson Cycle?

The final link from the Fichter site is really the most important one because it helps make the connection between the “big picture” (above) and the minerals and rocks (“thousands of individual pieces”) that we will work with throughout the semester (see below). Take a look at this page,

<http://csmres.jmu.edu/geollab/Fichter/Wilson/PTRC.html>

and

<http://csmres.jmu.edu/geollab/Fichter/Wilson/rkeytst.html>

We will work with these materials in the next lab.

Part II

In this part of the lab exercise you will investigate a few important websites that deal with the “thousands of individual pieces” that are part of the “bottom up” approach (minerals and rocks) to the study of the Earth Sciences. We will use the “bottom up” approach throughout much of the semester, especially in lab (never forgetting to keep the big picture in mind!). Some of these sites have questions that are bolded on your worksheet and should also be answered on the word document under heading part II.

Visit the following WWW sites:

1. <http://webmineral.com/> This is a very comprehensive site that covers many topics that we will work with in our class. Go to the “Java Crystals” link. Find “quartz” in the list of “New crystal forms” and go to this link. Experiment with “mouse functions” and the “Quartz Crystal Form” model just to get a feel of how the program works, but don’t worry about what it means for now.
 2. <http://mineral.galleries.com/>
At this site use the “Minerals by Name” links to find QUARTZ, and THE FELDSPAR GROUP.
 - a. **Print out pages (to be kept in a 3 ring binder) for Quartz, the Feldspar Group, and the feldspar mineral species: Labradorite and Microcline. You will keep a file of these and other important, rock-forming minerals that we study this semester in your own “virtual mineral collection”**
 3. <http://www.rockhounds.com/rockshop/table.shtml> This is a nice reference site put together by Bob (Bob Keller). The two sites below are from Bob’s collection of www resources
 4. http://www.rockhounds.com/rockshop/mineral_id/index.html This material is pretty standard stuff but may be interesting. Be aware of this site for future reference
 5. <http://www.rockhounds.com/rockshop/rockkey/index.html>
This is a rather elementary source of information about rocks and rock identification.
When additional material about rocks is needed, you may find this site useful.
- a. **What (10 or so) minerals form most rocks?**