

# Concord Syenite Project

**150 points – due by 5 pm [date TBD] – upload via ASULearn or hand in hard copy**

## Project Description

In this project, you will work in small groups to formally characterize an aspect of the Concord syenite and plutonic suite, NC, based on petrography, hand sample descriptions, and SEM and/or CL analyses. You will have two lab sessions and a field trip dedicated to working on this suite of rocks: one for detailed petrographic analyses and another SEM or CL imaging and analysis. The field trip on Feb 17<sup>th</sup> will be the field component of the project. These individual labs are ungraded, but all are required for completion of the project.

I have not specified a page limit or requirement for the collaborative paper - it is up to the group to decide how to best present their findings. *Longer papers are not necessarily better papers.*

## Your paper should include the following:

- Introduction – describe what you are doing in this project.
- Geologic History – this is where you reference the literature and any previous work on this particular rock formation, chemically similar rock formations, and the regional tectonic environment. You should have *at least* three (preferably more) journal or book articles cited in this section. Be prepared to compare and contrast the Concord syenite with similar rock units in other places, and/or .
- Petrography – summarize your lab notes for each sample, and include pertinent photomicrographs.
- Chemical Analysis – SEM analysis and images.
- Discussion – this is where you tie everything together: Are your petrography and SEM analyses consistent with what is in the literature? Do you have alternate explanations for the rock’s history based on your own work?
- References (use GSA reference styles - <http://www.geosociety.org/pubs/geoguid5.htm>)
- *Appendix with copies of ALL notes, calculations, drafts and revisions\**

## Grading

90 points	<b>Overall paper quality (group grade).</b> This includes petrographic analyses, SEM calculations, grammar and spelling, layout, clarity, readability, critical evaluation of your data in comparison to data in the literature, proper captions and labels for your images, graphs, and figures, etc. Thirty points will be based on presentation (spelling/grammar/etc. - see rubric on following page). Sixty points will be based on the scientific integrity of the paper.
40 points	<b>Quality of your individual input.</b> You will need to include copies of <u>all</u> your notes and calculations, as well as <u>all</u> the drafts and revisions of your paper. I will use your lab notes, calculations, and edits on the drafts of the paper to evaluate how you contributed to the effort. This can either be via handwritten notes on paper drafts or by using the Track Changes tool in Microsoft Word, and providing me with a file that includes all the markups. <b>If you do not provide me with multiple sets of drafts and revisions (i.e. you all stay up in the URL and write the paper the night before), you will receive a 0 for this part of the assignment.</b>
20 points	<p><b>* Peer Evaluation (Confidential - passed in separately via ASUlearn).</b> You will be asked to evaluate each other’s contributions (on a % scale) to the project for:</p> <ol style="list-style-type: none"> <li>1. petrographic analysis</li> <li>2. fieldwork</li> <li>3. SEM and/or CL data collection and analysis</li> <li>4. literature review and background research</li> <li>5. overall involvement in the formulation of the group’s hypothesis</li> <li>6. writing, editing, and formatting of the paper</li> </ol> <p><i>You are not permitted to give all members equal weight on more than one contribution, as this is unrealistic in the real world. Likewise, it’s probably not a wonderful idea to have one person fully responsible for the petrography, another fully responsible for the SEM data, etc. You need to fact check each other!</i></p> <p><b>These peer evaluations will be averaged and normalized to a scale of 20 points.</b></p>

Points	Criteria
30	Perfect spelling and grammar, perfect formatting
24	Minor spelling and grammar issues (no more than 6 spelling/grammar errors), but has perfect formatting
18	Minor spelling and grammar issues (no more than 12 spelling/grammar errors), minor formatting errors
12	Moderate spelling and grammar issues (no more than 18 spelling/grammar errors), and/or has major formatting errors
6	Major spelling and grammar issues (no more than 24 spelling/grammar errors), and/or has major formatting errors
0	Major spelling and grammar issues (more than 24 spelling/grammar errors), and/or has major formatting errors

### Useful References

- Fullagar, P.D., 1971, Age and origin of plutonic intrusions in the Piedmont of the southeastern Appalachians: Bulletin of the Geological Society of America, v. 82, p. 2845.
- McSween, H., and Harvey, R.P., 1997, Concord plutonic suite: Pre-Acadian gabbro-syenite intrusions in the southern Appalachians: MEMOIRS-GEOLOGICAL SOCIETY OF AMERICA, p. 221-234.
- McSween, H.Y., Sando, T.W., Clark, S.R., Harden, J.T., and Strange, E.A., 1984, The gabbro-metagabbro association of the southern Appalachian Piedmont: American Journal of Science, v. 284, p. 437.
- McSween Jr, H.Y., 1986, The Concord gabbro-syenite complex, North Carolina: Centennial Field Guide: Southeastern Section of the Geological Society of America, v. 6, p. 231.
- Misra, K.C., and McSween, H.Y., 1984, Mafic rocks of the Southern Appalachians; a review: American Journal of Science, v. 284, p. 294.
- Olsen, B.A., McSween, H.Y., and Sando, T.W., 1983, Petrogenesis of the Concord gabbro-syenite complex, North Carolina: American Mineralogist, v. 68, p. 315.

### \* Example of a Peer Evaluation:

- petrographic analysis (Daniel Boone Yosef 40%, Slow Joe Crow 20%, Typhoid Mary 40%)
- fieldwork (Daniel Boone Yosef 20%, Slow Joe Crow 60%, Typhoid Mary 20%)
- SEM and/or CL data collection and analysis (Daniel Boone Yosef 40%, Slow Joe Crow 10%, Typhoid Mary 60%)
- literature review and background research (Daniel Boone Yosef 10%, Slow Joe Crow 40%, Typhoid Mary 50%)
- overall involvement in the formulation of the group's hypothesis (Daniel Boone Yosef 60%, Slow Joe Crow 10%, Typhoid Mary 30%)
- writing, editing, and formatting of the paper (Daniel Boone Yosef 30%, Slow Joe Crow 40%, Typhoid Mary 30%)

### Typhoid Mary's Peer Evaluation Narrative

Our group had trouble communicating and scheduling times to meet so that everyone could attend, so we ended up relying on email for most of our communications. Dan always had to work whenever Slow Joe and I could meet, and didn't really put in much work on the literature review. Dan and I came up with the main hypothesis, and did the bulk of the data collection and analysis, and Slow Joe did the bulk of the fieldwork. We had a hard time connecting our field observations with our chemical and petrographic analyses - but I think that was because we waited until the last minute to figure out exactly what we were trying to show. If we had collaborated with each other throughout the project more, then maybe this would have been easier. I honestly felt like I put in the bulk of the work writing up the paper, and that the main ideas were mine, and that Slow Joe just sort of slacked off and went along for the ride - he did what Dan and I told him but didn't provide a lot of his own ideas. Even though Dan couldn't meet up with us in person often, he always was available on email. At the last minute Slow Joe had all these criticisms about what we'd done but hadn't been there to help out at all while Dan and I were working on it. This group experience was frustrating, and I think I could have done a better job if I had been working with other people.

### Slow Joe Crow's Peer Evaluation Narrative

Our group worked really well together. We scheduled regular times to meet to go over our ideas and designs, and everyone contributed equally, although our ways of contributing were different. Dan is really good at getting the text so that it is short and to-the-point, but still shows what you're trying to say. Mary is really good doing the petrography and analytical work. I am really good at doing all the background research and making sure that we have all the right details. Sometimes we argued a little bit but it always seemed constructive, like we made the paper better after having a lot of edits. I never felt like anyone was slacking off, or someone else was being too bossy, we all worked really well together.