

Exercise S3 – Self-Guided Tour of the Geology Teaching Museum

- Purpose** This lab will provide:
- 1) Access to an important study aid for geology students
 - 2) An opportunity to practice your understanding of geology outside the lab.

- Expectations** By completing this lab you will:
- 1) Integrate knowledge from previous laboratories.
 - 2) Find important resources that help you to study geology.

Introduction

Faculty of the Department of Geology created the F.K. and M.J. McKinney Geology Teaching Museum to provide an additional, out-of-class facility where students could see and read about different geological specimens and processes. The museum was named for longtime Appalachian geology professor Dr. F. Kenneth McKinney and his wife, Mrs. Marjory J. McKinney, who also worked in the department as the lab manager for many years. This lab is designed to help students utilize the museum to review information covered in labs earlier this semester.

Location

The museum is located just inside the main entrance to Rankin Science South, on the right-hand side of the atrium as you enter the building.

Hours

The museum is open *weekdays* from 8:00 AM until 4:30 PM. The museum is *closed* on weekends. The museum is occasionally open during the evening for review sessions or when geology majors are providing “answersphere” services.

Study specimens

Duplicate sets of the rock and mineral specimens used in the GLY 1101 laboratories are kept in drawers near the windows of the museum. These are provided for students to study any time the museum is open. Please be courteous to your peers and make sure that you return all specimens to their proper boxes and drawers.

Exercise

The following pages contain questions related to the geology teaching museum and its exhibits. The next page includes a map showing the current floor plan of the museum to help guide you to specific exhibits. You will likely find previous chapters in your lab manual useful as you work to answer these questions. A duplicate copy of this exercise will be posted on the museum website at <http://www.mckinneymuseum.appstate.edu/>. Please feel free to print it and complete it to prevent damage to your lab manual.

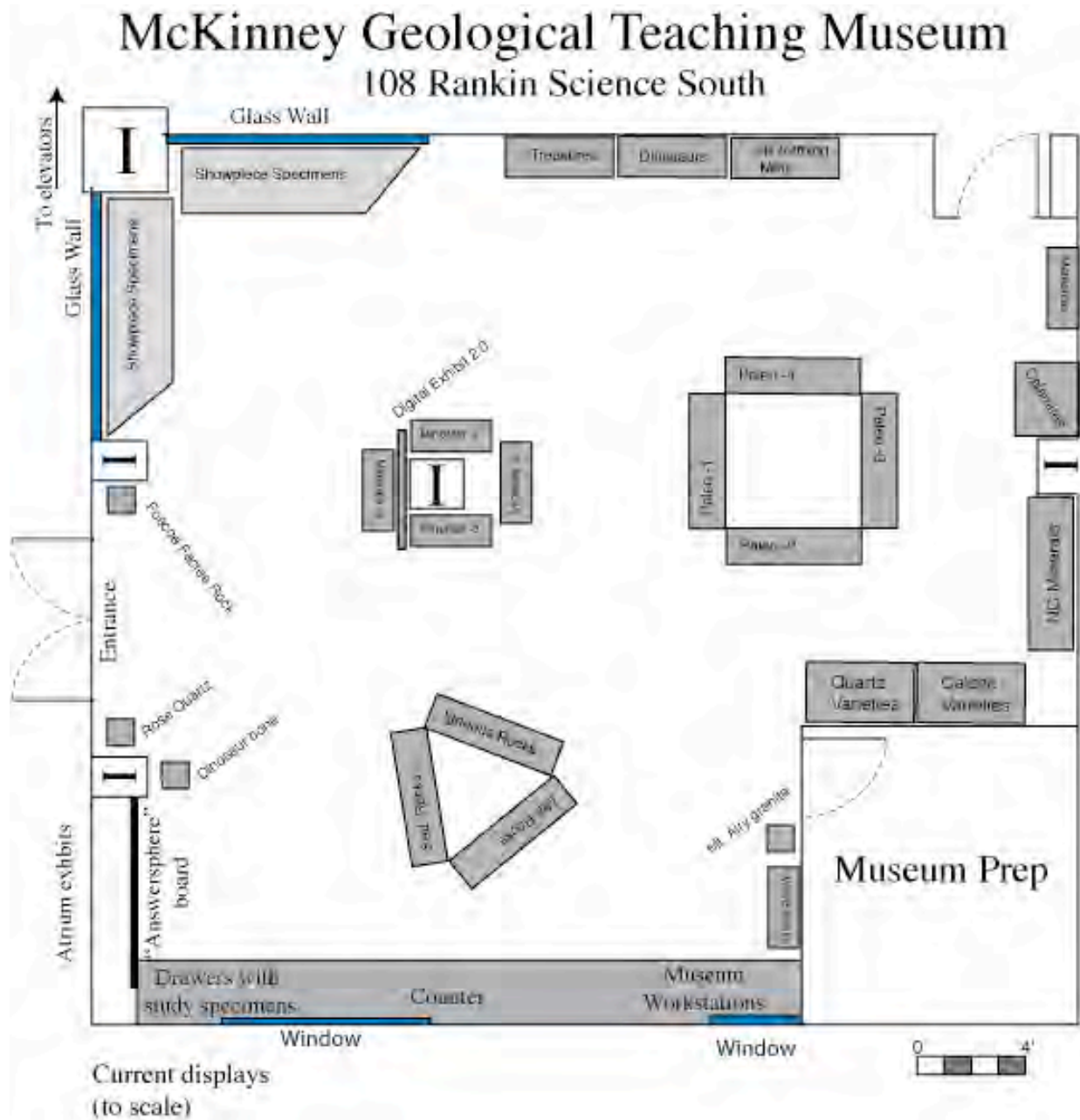


Figure S3.1. Floorplan of the McKinney Geology Teaching Museum, adjacent to the lobby in the main entrance of Rankin Science South before Fall Semester, 2006. Subject to alteration as exhibits change.

Questions

Before you even enter the museum there are exhibits to the right (east) of the museum doors. Use those exhibits to answer the following questions. Unless otherwise indicated, *please answer in complete sentences.*

Question 1. In the upper, fossil exhibit is a cast of *Archaeopteryx*. This is probably the most-copied vertebrate fossil in world, with most museums having a cast on display. What is significant about *Archaeopteryx*?

Question 2. In the lower, rock and mineral exhibit are a variety of specimens, some from North Carolina and others from around the world. Note the large Brazilian amethyst—what mineral is amethyst and what makes it that color?

Oversize specimens

Question 3. The museum contains several “showpiece” oversize specimens, on display in front of the windows by the atrium and the hallway. One of these specimens is essentially a large mineral specimen, four are rocks, and another one is a fossil.

(A) Which oversized specimen is a mineral, and what mineral is it?

(B) Which oversized specimen is a fossil, and what is it a fossil of?

Question 4. For the other four specimens, list the specimen name (from the museum label) and whether it is an igneous, sedimentary, or metamorphic rock. Then list its texture and the minerals likely to be present (mineralogy).

Specimen Name	Rock Type	Texture	Mineralogy

Question 5. Using a complete sentence or sentences, describe how one of the oversized specimens was formed and how old it is.

Question 6. Which of these six specimens do you find most interesting, and why?

Minerals

Many cases in the museum contain mineral exhibits. For the next few questions use the two cases “Variety in Quartz” and “Variety in Calcite.”

Question 7. List at least six colors of specimens in the quartz case.

Question 8. List at least four colors of specimens in the calcite case.

Question 9. Are any of these colors unique, i.e., is there a color of either quartz or calcite that you do not see in the other case? If so, what is it?

Question 10. Obviously, color is not very useful to identify either quartz or calcite. In spite of the variation in color, what diagnostic properties will characterize all specimens of:

(A) Quartz?

(B) Calcite?

Question 11. Using complete sentences, explain two or three simple tests that you would use to distinguish a specimen of quartz from a specimen of calcite.

Rock cycle

There are three cases dedicated to the rock cycle in the museum, one each for igneous, sedimentary, and metamorphic rocks. Use these cases to answer the following questions.

Igneous rocks case

The igneous rocks case shows that there are actually many more textures to igneous rocks than what we have tried to teach you. It also displays many different structures found in igneous rocks.

Question 12. Find one example of both an intrusive and an extrusive structure and describe how each formed in complete sentences.

(A) Intrusive structure:

(B) Extrusive structure:

Question 13. Note the block of granite (cube of Mount Airy granite) by the door to the museum office/work room. Complete the following chart.

Rock name	Rock type (ig/sed/met)	Texture	Mineralogy
Granite			

Question 14. What is unusual about this granite compared to most granite specimens you have studied?

Question 15. What does this tell you about the utility of color in identifying minerals in rocks?

Sedimentary rocks case

Sedimentary rocks record conditions at the earth’s surface in ages past, and are the only rocks that contain fossils.

Question 16. For the sedimentary rocks case, pick a favorite specimen and fill in the following chart based on the exhibit labels and the sedimentary rocks exercise.

Rock name	Rock type	Texture	Mineralogy

Question 17. What about this specimen made it your favorite?

Metamorphic rocks case

On the second shelf from the top there are examples of metamorphic textures.

Question 18. What are the two main textures of metamorphic rocks?

Question 19. Looking at the foliated metamorphic rocks, does the grade (intensity) of metamorphism increase or decrease from left to right across the shelf? Label the specimens below with the degree of metamorphism from lowest to highest.

Slaty Phyllitic Schistose Porphyroblastic schistose Gneissic

Geology of North Carolina

By the elevators in the atrium outside the museum are two cases with an exhibit on the geology of North Carolina. Using information from that exhibit, divide the map below into Blue Ridge, Piedmont, and Coastal Plains provinces.

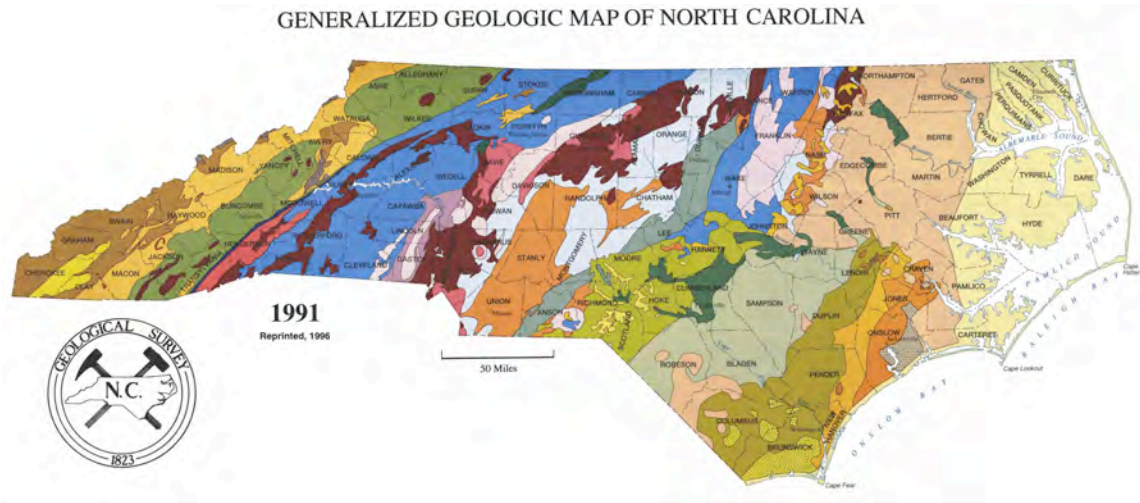


Figure S3.2. Generalized geologic map of North Carolina, modified from a map published by the North Carolina Geologic Survey and available online at: <http://gis.enr.state.nc.us/sid/bin/>

Question 20. Use the exhibits to fill in the following chart:

Province	Age (millions of years)	Rock type(s) (ig/sed/met)	Fossils? (y/n)	Favorite specimen
Blue Ridge				
Piedmont				
Coastal Plain				

Question 21. Which region has the most interesting geology (or at least the most interesting specimens) and why?

Final Question

Question 22. Find one other exhibit and/or specimen on display in the museum that you find interesting. In one or more sentences describe the exhibit or specimen, and in another sentence or two explain what you find interesting about the exhibit or specimen and what you would not have known or understood about it before taking geology this semester.

