

## ***FRENCHMAN MOUNTAIN ROCKS!***

Frenchman Mountain Geology

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### **Objectives:**

- 1) To learn how to find rock types on a geologic map.
- 2) To practice identifying rocks.
- 3) To learn what information is recorded on a geologic map.
- 4) To connect the geological history of an area with its rocks and to read its portrayal on a geologic map.
- 5) To learn how to locate rocks for collection.
- 6) To summarize several weeks' work on minerals and rocks.

**Grade Level:** Grade 6 and up.

**Time:** At least an hour. Students should already have worked on minerals and rocks, and should have an idea how igneous, sedimentary, and metamorphic rocks form. The students should read the included handouts on the Geology of Nevada and the Geologic time scale with major events in Nevada history

(<ftp://comstock.nbmng.unr.edu/pub/dox/imfprice.pdf>), and information on the Great Unconformity website

(<http://www.unlv.edu/Colleges/Sciences/Geoscience/pub/rowland/Virtual/virtualfm.html>) ahead of the class period.

### **Materials:**

- 1) Geologic map of Frenchman Mountain.
- 2) Assorted small rocks from areas covered by the map.
- 3) Rock descriptions (to be provided by instructor).
- 4) Paper and pencils or pens.
- 5) A copy of Nevada Bureau of Mines and Geology Map 127.
- 6) Geology of Nevada and Geologic time scale with major events in Nevada history.
- 7) "Geology of Nevada" by Jonathan Price, and others.
- 8) Frenchman Mountain and the Great Unconformity website:  
<http://geoscience.unlv.edu/pub/rowland/Virtual/geology.html>.
- 9) Geologic Tours in the Las Vegas Area, Expanded ed., Nevada Bureau of Mines and Geology Special Publication 16, by Joseph V. Tingley, and others.
- (10) Generalized (8 ½ x 11 inch) Geologic Map of Nevada  
(<ftp://comstock.nbmng.unr.edu/pub/dox/e30.pdf>)

### **Procedure:**

- Work in a group.
- The instructor will provide map, rocks from the map area, and rock descriptions.
- Locate landmarks on the map, e.g., North Lake Mead Blvd.
- Observe the colors and symbols on the map.
- Refer to the map key to locate the "stratigraphic column." Use this to determine the meaning of those colors and symbols. Note that the oldest rocks are shown at the bottom of the column, youngest rocks at the top.

- Examine the rocks provided and write descriptions for each, e.g., “Well-sorted medium-grained sandstone, dark brown weathered surface, tan on fresh surface.”
- Read the rock descriptions provided and compare to your descriptions.
- Place each rock on the spot on the map unit that seems closest to your description.
- Write a geologic history of Frenchman Mountain, referring to the Frenchman Mountain map and the “stratigraphic column” (the key to the rocks in the map, in order of age, with the oldest at the bottom). Start with the oldest rock listed in the stratigraphic column and work forward in time to the youngest. For example, sandstone indicates the existence of a sandy environment, perhaps sand dunes, or perhaps a sandy beach. If adjacent rock layers include shale and limestone of nearly the same age, the sandstone may indicate the start of an episode of rising sea level and the deposition of the sort of sediments found near shore, then in progressively deeper water.

**Discussion and Activities:**

- 1) What is the oldest rock from your selection?
- 2) What is the youngest rock from your selection?
- 3) Which rock(s) may have come from the ocean?
- 4) Which rock(s) may have come from a volcano?
- 5) Are there any sedimentary rocks? If so, which ones?
- 6) Are there faults shown on the map?
- 7) What are the most common rock units on the map? Does your selection include that rock?
- 8) Are there any mines in the map area? What commodity is being mined?
- 9) Refer to the 8 1/2 x 11 geologic map of Nevada. Locate where the Frenchman Mountain map would be (approximately) on that map.
- 10) Take Trip 3 in Geologic Tours in the Las Vegas Area to the overlook at Frenchman Mountain on North Lake Mead Boulevard.