6-2008

GSI: Geo Scene Investigation! Pre-visit Lesson: Lake Mead Geologic WebQuest (Grade 7)

Discover Mojave: Forever Earth

GRADE 7

GSI
Geo Scene Investigation!

PRE-VISIT LESSON

Lake Mead Geologic WebQuest

GSI
Geo Scene Investigation!

PRE-VISIT OVERVIEW

Geologists are scientitsts who study the structure and history of the Earth and its processes. Like detectives, geologists work to unravel the mysteries of the landscapes we see today using clues left behind by the geologic events that formed them. Through Forever Earth, students can get close to fascinating geological features and landforms to better understand the geologic processes that have shaped the Mojave Desert.

GSI: Geo Scene Investigation! introduces students to the differences between observations and interpretations and to some of the fundamental principles of geology. Students identify specific geologic processes and landforms in the landscape surrounding them at Lake Mead National Recreation Area (Lake Mead NRA) by solving mysteries with a set of geology-related clues.

Two pre-visit activities have been designed to prepare students for the on-site experience. The first activity (Topographic and Geologic Maps) introduces students to topographic and geologic maps and their respective purposes. The second activity (described herein) is an inquiry-oriented activity designed to introduce students to the geology, landforms, geologic processes, and geologic timeline of Lake Mead NRA.

THEME

The landscape reveals its story in the features and formations you see today.

KEY QUESTIONS

What geologic forces and processes created the landscape in Lake Mead NRA?
What forces and processes are still at work today?

GOAL

Students will demonstrate understanding of the geologic forces and processes that created the landscape in Lake Mead NRA and the forces and processes that continue to impact and shape today's landscape.

OBJECTIVES

Students will:

- use the Internet and other resources to gather information about Lake Mead NRA geology;
- use existing maps of Lake Mead NRA to create their own map showing landforms and geologic features relevant to this exercise;
- recognize major landforms at Lake Mead NRA and understand that these landforms result from distinct geologic processes; and

- construct a time line for Lake Mead geology and understand the age of geologic formations and landforms.

NEVADA SCIENCE CONTENT STANDARDS

E.8.C.1. Students know sedimentary rocks and fossils provide evidence for changing environments and the constancy of geologic processes.

E.8.C.5. Students know how geologic processes account for state and regional topography.

N.8.B.2. Students know scientific knowledge is revised through a process of incorporating new evidence gained through on-going investigation and collaborative discussion.

CLARK COUNTY SCHOOL DISTRICT OBJECTIVES (GRADE 7)

Students will:

- distinguish between sedimentary, igneous, and metamorphic rocks;
- describe how water can exert forces (physical weathering) on landforms;
- diagram the rock cycle;
- model erosion and deposition;
- describe how water, wind, glaciers, and gravity contribute to erosion;
- describe how landforms are the result of a combination of constructive and destructive processes;
- describe the value of collaboration in developing scientific understanding;
- critique explanations and evidence presented by peers;
- present results and data to class; and
- discuss careers related to Earth Science.

SNAP CONSERVATION EDUCATION AND INTERPRETATION THEME CORRELATIONS

The on-site grade 7 activities support the following theme statement developed by Clark County-based educators:

- Sub theme 2. We share the intriguing stories of Southern Nevada's diverse, interconnected natural world.

This sub theme is derived from the guiding theme statement: Increasing human activity on highly sensitive and easily damaged lands has profoundly altered the natural environment of Southern Nevada, affecting native biota including threatened and endangered species and requiring active management of native and non-native species.

PREREQUISITE CLASSROOM EXPERIENCES

Lessons and discussions on:

- rock types and the rock cycle.
- geology as a field of research.

Small group application in problem solving:

- logistics in cooperative research and working in teams (e.g., using time efficiently, deciding who does what).
- use of computers and the Internet to gather information.

VOCABULARY

- cliff
- constructive forces
- cross-bedding
- destructive forces
- igneous rock
- lava flow
- mass wasting
- metamorphic rock
- sedimentary rock
- tilting
- wave-cut terraces

PRE-VISIT LESSON: Lake Mead Geologic WebQuest

Part 1 ▸ Introduction to WebQuest

TIME 5 minutes
MATERIALS

This activity is an inquiry-oriented activity designed to introduce students to the geology, landforms, and geologic processes of Lake Mead NRA. Most of the information collected by students is to be drawn from the Internet.

The class is told that they are going on a WebQuest to gather relevant information on the geology, landforms, and geologic processes at Lake Mead NRA that they will encounter on their upcoming G.S.I. Geo Scene Investigation field trip. The teacher divides the class into teams of four, and each team member will serve as one of four specialists: Cartographer, Geologist, Geomorphologist, and Historian.

Part 2 ▸ Embarking on the WebQuest

TIME 1-2 class periods (some of the research could be homework)
MATERIALS
Computers with Internet connection, library, student text books, other Earth Science reference books

Student Reference: Lake Mead Geologic WebQuest

Within each team, members take a few moments to discuss and decide which student will play the role of which specialist. They should also discuss how they might assist each other as team mates (e.g., one specialist might find information that could be helpful to one of his or her team mates). Students then proceed to the computer laboratory to embark on the WebQuest following the directions given in **Student Reference: Lake Mead Geologic WebQuest** and according to the roles they have selected.

Note: all rock samples must be collected only from places where it is legal to do so. No rocks may be removed from any state or national park areas.

Part 3 ▸ Putting it All Together

TIME 1-2 class periods

The teams compile their research into a class presentation. The

presentation consists of oral and visual components. Student groups may decide on the format or the teacher chooses a format for the presentation. Suggested formats: poster, model, PowerPoint presentations, or other digital presentation formats.

MATERIALS

depends upon format selected

Part 4 ▸ Presentation of Findings

Groups present their projects to the class. Each member of the group must participate in the oral presentation. A suggested grading rubric is provided (**Teacher Reference: Lake Mead Geologic WebQuest Rubric)**.

Part 5 ▸ Synthesis and Closure

The class considers the career roles that students played in this activity, either aloud or in their journals. Possible questions: *Did you like the job of the specialist you selected? Why or why not? Did another specialty seemed more interesting to you? Why do you think research teams are made up of groups of diverse specialists who work together?*

The teacher summarizes: *We have studied the landscape of Lake Mead National Recreation Area and know a little about "the story" of its formation and features. We'll keep this information in mind when we visit Lake Mead for our Forever Earth field trip.*

EXTENSIONS

- Students share their presentations with other classes.
- Students write an essay describing what they think will happen (geologically) to the Lake Mead National Recreation Area during the next 100 years, 1000 years, 10,000 years, 1,000,000 years, or more.
- The teacher helps and prepares students to contact a professional in their area of research. An interview could be conducted online (by e-mail) or in person.

RESOURCES

Student text book

Smith, Michael J. Investigating Earth Systems: An Inquiry Earth Science Program. Armonk, New York: It's About Time, Inc., 2006.

Webquest Websites

Teachers can learn more about Webquests as a teaching tool at the following websites:

http://webquest.sdsu.edu/
http://webquest.org

ADAPTATIONS FOR DIVERSE LEARNERS

- Consult with the Forever Earth project manager prior to field trip to discuss specific needs of the class or individuals; decide which aspects or the program content or delivery to appropriately alter for culturally/linguistically, behaviorally, and cognitively diverse learners and for the gifted and talented.
- Implement peer assistance by strategically forming student groups.
- Provide models of finished presentations and assist teams in selecting the best format for their presentations.

ASSESSMENT

The teacher carefully listens to the geologic map presentation and considers whether key concepts are included and represented accurately, using **Teacher Reference: Lake Mead Geologic WebQuest Rubric**. Additionally, teams are assessed according to ability to function and to self-monitor for task completion.