

Brooke Simons
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Which Part of the Great Salt Lake Stinks More? (Introduction for the Field Trip)

Abstract:

This lesson is intended to give students background knowledge of the Great Salt Lake. This lesson requires the use of the Internet. To introduce the students to some important information about the lake the students will be dividing into groups. Each of these groups will have certain questions from a worksheet to answer. Then using the jigsaw puzzle method the groups will share their answers and get the answers to the remaining questions. The remainder of the work is going to be divided between three groups: “Brine Shrimp”, “Birds”, “Islands”, and “Bacteria/Algae”. There will be helpful links and tasks relating to all of the groups research. These respective groups will then present their findings to the rest of the class. This lesson is intended to introduce students to key concepts and information about the lake in order to conduct an inquiry experiment relating to the title question above.

Grade Level:

Fourth Grade

Utah Elementary Core Curriculum Standards:

Topic: Utah’s Great Salt Lake

Standard 5:

Students will understand the physical characteristics of Utah's wetlands, forests, and deserts and identify common organisms for each environment.

Objective 1:

Describe the physical characteristics of Utah's wetlands, forests, and deserts.

- Compare the physical characteristics (e.g., precipitation, temperature, and surface terrain) of Utah's wetlands, forests, and deserts.

Objective 2:

Students will be able to describe the common plants and animals found in Utah environments and how these organisms have adapted to the environment in which they live.

- Identify common plants and animals that inhabit Utah's forests, wetlands, and deserts.
- Cite examples of physical features that allow particular plants and animals to live in specific environments (e.g., duck has webbed feet, cactus has waxy coating).
- Describe some of the interactions between animals and plants of a given environment (e.g., woodpecker eats insects that live on trees of a forest, brine shrimp of the Great Salt Lake eat algae and birds feed on brine shrimp).

In Class Instructional Time: Three 60 Minute Sessions

Key Vocabulary:

Lake Bonneville: A prehistoric lake, formed about 30,000 years ago (late in the Pleistocene Epoch), that at high water covered an estimated 20,000 square miles (52,000 square km), embracing much of what is now the western half of Utah and parts of Nevada and Idaho in the United States. Surviving remnants are the freshwater Utah Lake and the saline Great Salt Lake and Sevier Dry lakes.

Great Salt Lake: A lake in northern Utah, U.S., the largest inland body of salt water in the Western Hemisphere and one of the most saline inland bodies of water in the world. The lake is fed by the Bear, Weber, and Jordan rivers and has no outlet. The lake has fluctuated greatly in size, depending on the rates of evaporation and the flow of the rivers that feed it.

Salinity: Consisting of or containing salt.

Ecosystem: The term used when considering living organisms, their physical environment, and all their interrelationships in a particular unit of space or surrounding area.

Food Web: An interconnected feeding relationship also known as a food chain. Most food chains consist of three or four levels. A typical sequence may be plant, herbivore, carnivore, top carnivore.

The purpose of this lesson is to introduce the students to the Great Salt Lake. While investigating, students will come across many of these terms on their own. The purpose is for them to find key information and present it to the rest of the class.

Definitions from <http://www.britannica.com/search?query=Ecosystem&ct=&fuzzy=N>

Intended Learning Outcomes:

- Students will have a basic understanding and background knowledge of the Great Salt Lake prior to our field trip.
- The students will be able to identify specific wild life at the Great Salt Lake on our field trip.
- The students will be able to identify the islands in the Great Salt Lake on our field trip.

Background:

The Great Salt Lake is an important part of the Northern Utah landscape. It has a very unique and interesting ecosystem. The lake has a huge commercial Brine Shrimp Cyst industry. The lake also has high salinity levels comparing to that of the Ocean and the Dead Sea. Sometimes, heavy winds will create a stink in the valley that is caused by the Great Salt Lake. The lake is divided into two parts by a railroad causeway. The northern part is referred to as the North Arm and the southern part is referred to as the South Arm. The North Arm is saltier than the South Arm and more organisms live in the South Arm. The water in the North Arm surrounding the Spiral Jetty (a man made spiral rock formation) has a pinkish hue due to the bacteria living around it. The lake has been very low in past 5 years due to the draught that Utah has been experiencing.

Materials:

- Internet Access
- Worksheet “Background Information for the Great Salt Lake”
- Paper
- Pencils
- Markers and or colored pencils

Assessment of Prior Knowledge:

Using a concept map on a large poster board, the students will brainstorm some things that they already know about the Great Salt Lake. It is most likely that many students will have heard about or even seen the Great Salt Lake and many will even know that it is salty. This is a great way to determine what students already know about the lake as well as a great opportunity to see how many students have actually been to there.

Instructional Procedures:

Day 1

1. After the above brainstorming session, hand out the “Background Information” worksheet. Tell the students that we will be working online today to learn more information about the Great Salt Lake in order to prepare for our field trip.
2. Divide the class into groups of four. Assign each group questions to answer on the worksheet (For example: group 1 answers questions 1-4, group 2 answers questions 5-8, etc).
3. Each group will need to use the UEN activity webpage at:
http://www.uen.org/utahlink/activities/view_activity.cgi?activity_id=13941.
They will need to go to the Utah Geological Survey link connecting to:
<http://www.ugs.state.ut.us/online/PI-39/>
Once there each group of students will need to click on their previously assigned questions that they need to answer on their “Background Information” worksheets.
4. Once the groups have answered their questions, separate the students into groups of four within each original group (For example: everyone in group 1 gets a number 1-4 in order to determine their new group. Do the same for the rest of the groups). This will ensure that each group has someone that can answer all of the questions on the worksheet.
5. After the “jigsaw puzzle” sharing activity, ask divide the students into groups again. This time divide the students into four groups: one that will be focusing on birds (Bird Group), one focusing on brine shrimp (Brine Shrimp Group), one focusing on the islands (Islands Group), and one focusing on bacteria and algae (Bacteria/Algae Group) and how the food chain/ecosystem in the Great Salt Lake works.
6. Using the same web activity at:
http://www.uen.org/utahlink/activities/view_activity.cgi?activity_id=13941
Students will follow the directions on the webpage, each group going to their specific sites and completing the given tasks.
 - The “Brine Shrimp” group should go to the “USGS – Brine Shrimp” link connecting to: <http://ut.water.usgs.gov/shrimp/index.html>
 - The “Birds” group should go to the “Birds of Great Salt Lake” link connecting to: <http://ut.water.usgs.gov/birds/index.html>
 - The “Islands” group should connect to the “Great Salt Lake Map” link connecting to: <http://ut.water.usgs.gov/greatsaltlake/images/GSLmap2.jpg>

■ The “Bacteria/Algae” group should connect to the “Great Salt Lake Food Web” link connecting to:

<http://people.westminstercollege.edu/faculty/tharrison/gslfood/>

Each group should use drawings and illustrations and or maps that will aid them in presenting their topics to the rest of the class.

Day 2

1. Students will continue to work in their groups finishing any activities that they did not complete on Day 1. They will have an hour today to complete their tasks and to prepare to present it to the rest of the group.

Day 3

1. Give the groups about 10 minutes to get together any last minute things they may need.
2. Each group will then have 5-7 minutes to present their findings to their classmates.
3. Use the remaining time to go over each groups presentations and to discuss each groups tasks that they will be doing at the Great Salt Lake (this would be in another lesson plan).

Discussion Questions:

What are some of the organisms that live in the Great Salt Lake?

What are the two parts of the lake called?

How many islands are in the Great Salt Lake?

How do you think the Great Salt Lake effects Utah?

Assessment Strategies:

■ Circulate around the room during the worksheet activity. Students will hand these in and receive them back the next day.

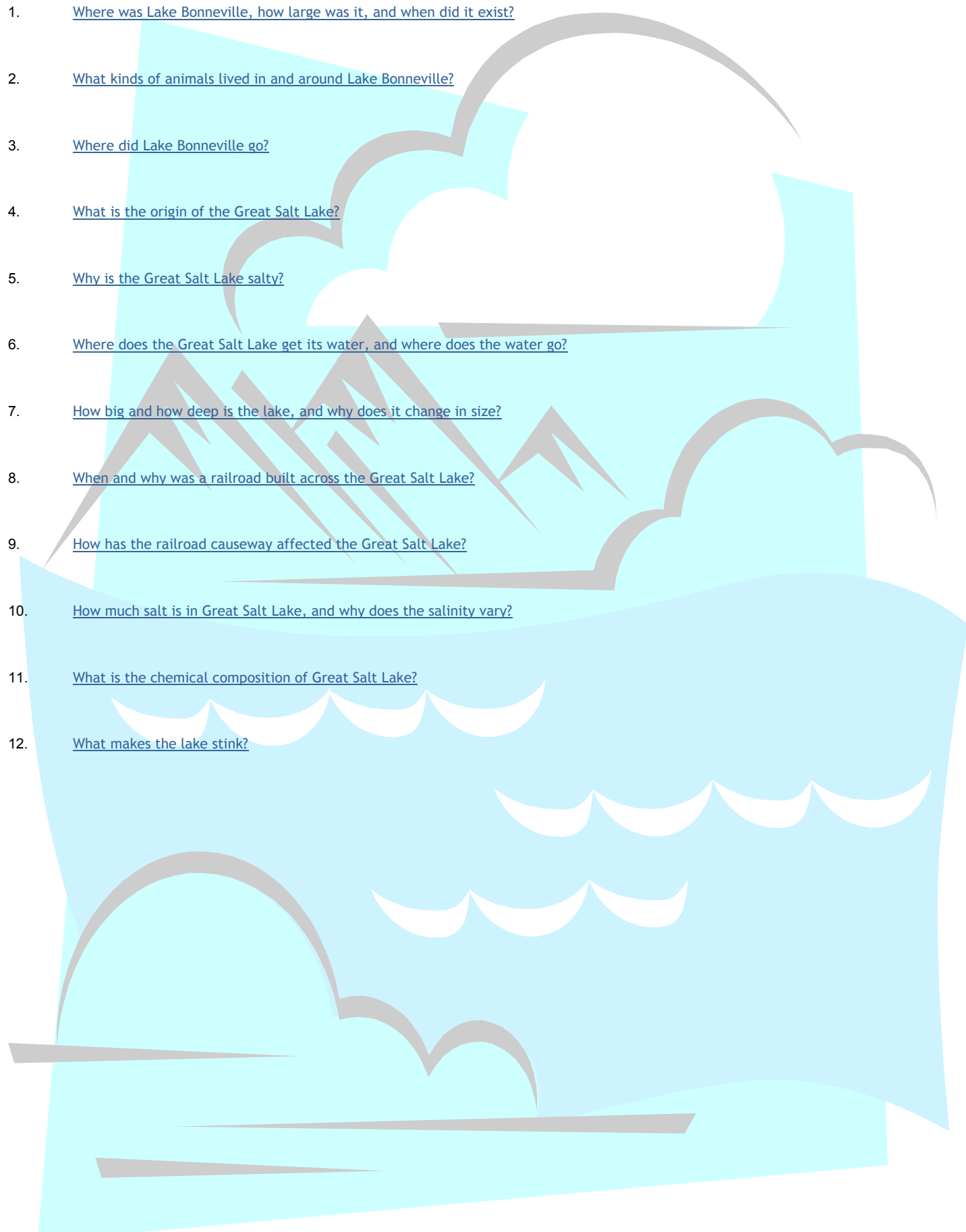
■ Using a rubric (that the students should receive as well) grade the student’s presentations accordingly. Make sure they have all the information they will need for the field trip. They should hand in all of their work/resources that they used in their presentations.

■ Revisit the brainstorming poster board from the pre-assessment activity. Make another concept map and compare the two.

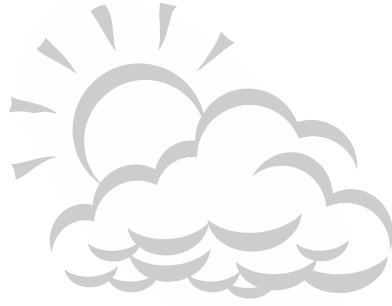
■ Use the discussion questions above to generate a discussion.

The “Background Information” worksheet and a check list for grading the presentations will be attached

Background Information for Great Salt Lake

1. [Where was Lake Bonneville, how large was it, and when did it exist?](#)
 2. [What kinds of animals lived in and around Lake Bonneville?](#)
 3. [Where did Lake Bonneville go?](#)
 4. [What is the origin of the Great Salt Lake?](#)
 5. [Why is the Great Salt Lake salty?](#)
 6. [Where does the Great Salt Lake get its water, and where does the water go?](#)
 7. [How big and how deep is the lake, and why does it change in size?](#)
 8. [When and why was a railroad built across the Great Salt Lake?](#)
 9. [How has the railroad causeway affected the Great Salt Lake?](#)
 10. [How much salt is in Great Salt Lake, and why does the salinity vary?](#)
 11. [What is the chemical composition of Great Salt Lake?](#)
 12. [What makes the lake stink?](#)
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Group Specific Questions



Brine Shrimp Group

1. [What activities/industries exist in and near Great Salt Lake?](#)

Birds Group

1. [What lives in and around Great Salt Lake?](#) (Hint: the third paragraph talks about birds).

Islands Group

1. [How many islands are in the Great Salt Lake, where are they, and are they inhabited?](#)

Bacteria/Algae Group

1. What lives in and around Great Salt Lake? (Hint: the second paragraph will be helpful to you).

Checklist for Group Presentations

The following should all be handed in together:

- One paragraph that compiles all of the information found on given topic
- Drawing/diagram or picture illustrating given topic
- “Background Information” worksheet
- “Group Specific Questions” worksheet
- Any additional resources/reference page

Presentation Criteria

- Group was well organized
- All members of group spoke at least once
- Group used a visual aid such as a drawing or picture
- Group covered topic enough to give basic background information about their given topic
- All given assignments from the web activity were completed and used as a reference

Each of the above checks is worth 10 points. The total assignment is worth 100