Melinda Reynolds
Christi Gallon
Fall, 2002

Exploring Great Salt Lake (GSL)

Abstract:
Class will take a field trip to GSL to explore the different types of plants. This trip will introduce them to different environments in which plants live. This lesson introduces the idea of salinity or amount of salt in the soil and water. Students will classify the types of plants that grow around the Great Salt Lake.

Grade Level:
4th

Utah Core Curriculum Standards:
3040 – 03
Standard 3

Students will understand the basic properties of rocks, the processes involved in the formation of soils, and the needs of plants provided by soil.

Objective 3

Observe and list the components of soil (i.e., minerals, rocks, air, water, living and dead organisms) and distinguish between the living, nonliving, and once living components of soil.

Duration:
1 school day

Background Information:
Great Salt Lake is a remnant of the pre-historic Lake Bonneville. Lake Bonneville was an enormous inland sea that covered the entire Salt Lake Valley. The loss of the sea water after a dam broke left behind only a salty puddle: Great Salt Lake. The loss of water and evaporation explains why there is so much salt around our area…the Salt Flats, and of coarse Great Salt Lake. There is a high level of salt in the soil in the area around the lake. Very few plants can survive this condition. Only "halophytes" (salt loving plants) are built for growing in this soil.

Terminology:
- Salinity – the amount of salt
- Pickleweed – plant at GSL
- Salt Grass - plant at GSL
- Grease Wood - plant at GSL

- Iodine Bush - plant at GSL

Intended Learning Outcomes:
Students will observe, identify, and classify the different plants at GSL.

Prior Knowledge Assessment:
Teacher will lead a class discussion on what students know about GSL. Each student will fill out a "Know," "Want to Know," and "Learned" handout. This is designed for the students to write down the facts they already know about GSL. We will design our inquiry around what the children know, but more importantly what they "Want to Know."

Materials:
Signed permission slips, volunteers, science journals, zip loc baggies, colored pencils, a handout with pictures of the plants at GSL, and a field microscope.

Procedures:
Prior to leaving discuss as a class the types of plants that grow near GSL. Students will hypothesize about the number of plants they will find at GSL in addition to the main plants in their science journals. Students will explore the area around "Black Rock." Students will observe the waters edge. Are there any plants there? Why or why not? Students will be required to observe at least 3 artifacts under the field microscope, and record their findings in their science journals. Students will also draw pictures of the plants they find in their science journals and write the physical characteristics of each plant. Students will take samples of the different plants they find for discussion in class.

Closure:
Students will get into their pre-set groups to discuss their findings. They will then compare their samples with the handout, and make their findings public by presenting them to the class. Did their hypothesis match their findings? Why or why not? This will lead nicely into the next lesson where the students will again create a hypothesis about plants and salt water.

Assessment:
Students will hand in their science journals for teacher review. Teacher will observe group interaction, cooperation, and presentations

Resources:
http://people.westminstercollege.edu/faculty/tharrison/gslplaya99/index.html
http://elib.cs.berkeley.edu
http://www.peds.arizona.edu
Picture of Black Greasewood:
http://elib.cs.berkeley.edu/cgi/img_query?enlarge=8253+3202+3490+0047
Picture of Salt Grass
http://elib.cs.berkeley.edu/cgi/img_query?enlarge=5208+1611+2414+0008
Picture of Iodine Bush

http://www.peds.arizona.edu/allergyimmunology/southwest/grass_weeds/iodine2htm
Picture of Pickleweed
http://elib.cs.berkeley.edu/cgi/img_query?enlarge=0000+0000+1002+0369

Melinda Reynolds
Christi Gallon
Fall, 2002

Will the Salinity Level of Soil Effect the Growth of Lima Beans?

Abstract:
In groups of four, students will conduct an experiment with lima beans and different soil salinity levels. This lesson introduces the idea of salinity levels and adjusting them through mixing measuring, and experimentation. The experiment will determine is Lima Beans can grow in soil that has been watered with varying levels of salt water.

Grade Level:
4th

Utah Core Curriculum Standards:

Standard 3

3040-04 Students will understand the basic properties of rocks, the processes involved in the formation of soils, and the needs of plants provided by soil.

Objective 3
Students will observe the basic components of soil and relate the components to plant growth.

Duration:
This lesson will be conducted over a 4 week period.

Terminology:
- Salinity level – The amount of salt in something.
- Germination – To cause to sprout or grow.
- Growth rate – How fast something grows.

Background Information:
Soil is made up of different types of minerals. Plants use these different minerals in the soil to grow, and sometimes the minerals in the soil inhibit the plants growth. The soil at the Great Salt Lake is unusual because it has high levels of salt (different salts are present, but most common is table salt = sodium chloride). The plants around GSL have had to adapt to these levels. Students will use their prior knowledge of plants and plant growth to conduct this experiment.

Intended Learning Outcomes:

- Students will hypothesize about Lima bean growth in soil that has been watered by varying levels of salt water.
- Students will mix salt with water to create different salinity levels.
- Students will record daily observations in their science journals.

Prior Knowledge Assessment:

Teacher will lead a class discussion on what students know about plants and plant growth. Each student will fill out a "KWL" handout. Students will also refer back to the original "KWL" sheet they filled out before and after visiting GSL. Students will utilize the "L" (what I learned) to hypothesize the outcome of this experiment.

Materials:

- 12 Styrofoam cups
- 1 cookie sheet
- 12 Lima beans
- 12 C. potting soil
- 1 Set of measuring spoons
- Measuring cup w/ml also
- Table salt
- Tap water
- Salt water conversion chart
- 4 containers with lids (Tupperware, or Glad-ware)
- Sunny spot to grow
- Science journal
- Magnifying glass

Procedures:

1. Recap terminologies used in the first lesson.
2. Introduce new terminologies; germination, and growth rate.
3. Divide class into groups of four by having them count off.
4. Soak 12 Lima beans in tap water overnight.
5. Using the salt water salinity conversion chart, measure 1 ½ tsp. of salt into 1000 ml of tap water to make a 1% salinity solution. Label container and 3 Styrofoam cups "1%." Next, measure ¾ tsp. of salt into 1000 ml of tap water to make a ½% salinity solution. Label container and cups accordingly. Last, measure 3/8 tsp. of salt into 1000 ml of tap water making a ¼% salinity solution. Label all containers appropriately. Measure 1000ml of tap water into a container. Label container and cups 0% salinity.
6. Make a small hole in the bottom of each cup to allow excess water to run out…place cups in the cookie sheets to catch the extra water.
7. Measure 1 C. potting soil into each of the Styrofoam cups.
8. Poke Lima bean about ½ way down the soil in each cup.
9. Feed each soil/bean cup with 3 Tbsp. of the corresponding water.

10. Place cups in the cookie sheet.
11. Put cookie sheet in a warm, sunny place to grow.
12. In their science journals students will hypothesize on which Lima beans will grow the best.
13. Repeat #6 daily over a four week period.
14. Record daily observations in science journal.
15. Team members will compare results with their hypothesis, and draw conclusions based on their observations.
16. Each team will chart their results.

Closure:
Students will first present their finding to their team members. They will then present their group findings, and chart to the class.

Assessment:
Students will hand in their science journals for teacher review. Teacher will look for critical thinking skills, a well thought out hypothesis, daily observations, and effort put into accurately recording their findings. Teacher will observe group interaction, cooperation, and presentations.

Resources:
Salt Water Conversion Chart
Project SLICE : The Friends of Great Salt Lake Initiative for Conservation Education