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## **Introductory Lesson Plan**

**Abstract:** This lesson will introduce students to the Great Salt Lake (GSL) environment and the various components of it. The purpose of this lesson is to give students an experience with the actual phenomenon of algae. The students will participate in a teacher-directed lesson allowing students to make observations about algae and the components of it.

**Grade Level:** 3<sup>rd</sup> Grade

### **Core Standards:**

Standard 2 Objective 1- Classify living and nonliving things in an environment.

Standard 2 Objective 2- Describe the interaction between living and nonliving things in a small environment.

**Time:** 60 minutes

### **Terminology:**

Algae: A plant or plantlike organism composed of one cell.

Salt Water: Water contained dissolved salt

Salinity: The concentration of dissolved salts in water, the percent of dissolved salt in a solution.

Environment: The external conditions affecting the life of a plant or animal.

Ecosystem: A living community, including its environment.

### **Intended Learning Outcomes:**

The students will make observations about algae and its environment.

The students will be introduced to algae and the components of it.

The students will understand the role of algae in the GSL.

### **Background Information:**

The algae in the GSL plays a very crucial role to the overall ecosystem of the GSL. The algae in the GSL are part of the food chain and provide food for other organisms at the GSL. Algae are considered a living organism because it grows, and various components of it change, such as color, shape, and makeup, etc. The GSL has a salinity level between 10-15%.

**Materials:** Jars, tape, markers, Ziploc bags, field microscope, microscope for classroom.

**Assessment of Prior Knowledge:**

Upon arrival at the GSL, the students will gather around and will be shown algae from the GSL. Ask the students various questions such as: Do you know what this is? Have you algae anywhere else? What is it for? What does it do? What role does it play? Where is it most commonly found? Are algae a living or non living thing? And Why? How does it live? Is the salt water a living or non living thing? After asking questions, ask the students what else they want to know about algae, salt water and etc.

**Procedures:**

1. After you have assessed prior knowledge, you will have an idea of where the students are and this will influence where you begin your introductory lesson to algae.
2. Group the students in pairs, give each pair a jar, and have them go collect what they think is algae. Bring algae back to group and regroup.
3. Discuss what the students found, ask them to describe what it looks like and where they found it, as well as other observations. Discuss with students the role of algae in the ecosystem, examine and observe the ecosystem they have collected in their jars. For example the rock, brine shrimp, brine shrimp casing, etc.
4. Explain more about algae and its environment to the students, talk about elements such as the salinity of the water, the color of the algae, where it is found, how it lives, what lives on it and any other questions the students were unsure of or wanted to know.
5. After discussing the basic concepts of algae and its environments, have students get in the same pairs and re-evaluate their algae. Students will want to make sure that what they have gathered is algae and that they have a good amount of algae in their jars.

**Assessment:**

After the students gather their algae have the students write a reflection in their science journals about what they learned about algae and its environment. Instruct the students to also include drawings of their algae and any additional questions they have. When looking at the journal entries evaluate based on how well the information they write relates to what we learned. Also, evaluate drawing making sure that what they have drawn is actually algae.

**References:**

<http://www.webster.com>

[http://westminstercollege.edu/education\\_gslp/](http://westminstercollege.edu/education_gslp/)

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## **How Fresh Water Affects Great Salt Lake (GSL) Algae**

**Abstract:** This lesson will be a fun, hands-on activity where the students explore algae and the effects of water on it. Through observation and experimentation they will observe the algae in fresh water vs. salt water.

**Grade Level:** 3rd grade

### **Core Standards:**

Standard 2 Objective 1- Classify living and nonliving things in an environment.

Standard 2 Objective 2- Describe the interaction between living and nonliving things in a small environment.

**Time:** 60 minutes initial set up time  
15-20 minute intervals daily for the next week

### **Terminology:**

Algae: A plant or plantlike organism

Salt Water: Water contained dissolved salt

Fresh Water: Water with a low salinity level.

Salinity: The concentration of dissolved salts in water, the percent of dissolved salt in a solution.

Environment: The external conditions affecting the life of a plant or animal.

Osmosis: Osmosis is the passage of water from a region of high water concentration through a semi-permeable membrane to a region of low water concentration.

### **Intended Learning Outcomes:**

Students will observe the effects of fresh water on GSL algae.

Students will perform experiment and make their own conclusions about algae and what will happen if it is taken out of its natural environment.

### **Background Information:**

Students will create their own hypothesis about what will happen in the experiment, many conclusions can be made such as: The algae in the fresh water will break apart and might be harder to grab, the algae in the fresh water might become darker in color, or the algae may stay similar in color and characteristics to how it began and so on. Students

may also make observations about the cells in the algae. The cells in the fresh water algae appear to shrink and the cells of the algae in the salt water appeared to grow. Changes occur when the algae is switched from one ecosystem to another, due to osmosis. Osmosis is the passage of water from a region of high water concentration through a semi-permeable membrane to a region of low water concentration.

**Materials:** Field microscopes, algae from GSL, 6 small containers for each group, salt water from the GSL, or salt water at a 16% salinity level (28 tsp. salt in 1000 ml of water produces a solution at 20% salinity level), fresh water, tape, marker, lab books, and writing utensils, .

**Assessment of Prior Knowledge:**

Review the previous lesson done at the GSL on algae. Ask students about any further questions they have or wrote in their science journals. As students discuss what they learned, there may be need to review concepts.

**Procedures:**

1. Ask students about water that the algae lives in. Ask if it has to be a certain type of water, why or why not? Will the type of water affect whether the algae from the GSL lives or not?
2. Explain to the students that they will be conducting an experiment to find out how algae will react to salt water and fresh water.
3. Have students come up with a hypothesis about what will happen to the algae in the different water solutions.
4. Prepare to set up experiment in lab notebooks with students, modeling and assisting students. Help the students write down their hypotheses in their books, as well as an explanation of the experiment, a list of materials, diagram of the experiment and steps in the process. Make sure to provide scaffolding for students.
5. Have students gather materials they will need: 6 small containers per group, field microscope, fresh water, GSL algae, GSL water, tape, marker, colored pencils and lab books.
6. Set up experiment with students
  - a. Label and number three containers GSL water and the other three, fresh water.
  - b. Put the same amount of algae in each container.
  - c. Put the same amount of GSL water in three of the containers.
  - d. Put the same amount of fresh water in the remaining three containers.
  - e. Observe algae. Label a section in lab book "Day 1", look at samples in field microscope and draw pictures of samples.
  - f. Seal the containers and write students initials on tops of containers.
  - g. Observe samples daily for one week and record findings with drawings and small descriptions of samples.
  - h. Gather data from whole class at end of week and discuss as a class to draw conclusions about experiment.

**Assessment:**

The students will summarize their findings after class discussion, making sure to connect it to their original hypotheses. The students will be assessed based on their lab books and their involvement in class discussions and experiment. Evaluate based on drawings and descriptions of the experiment. Also look to see if findings correlate with information learned.

**References:**

<http://www.webster.com>

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