

# Brine Shrimp Inquiry Lab

## Summary

Students will engage in a long term lab investigating biotic and abiotic influences on an ecosystem.

## Time Frame

4 class periods of 60 minutes each

## Group Size

Small Groups

## Materials

36 quart jars

brine shrimp cysts (available at salt water aquarium stores)

algae (from a salt water tank) or yeast culture slides

coverslips

plastic pipettes

microscopes

rock salt

microscope camera

incandescent light bulbs to provide heat

(perhaps make students provide anything else they would like to include)

- [student sheet](#)

(attached)

## Background for Teachers

### Time needed:

**Notes to Teacher:** A warm temperature is key to having the shrimp hatch quickly. Place all mini ecosystems under some sort of heat lamp to ensure hatching. For the short duration of this experiment the brine shrimp actually don't need an outside food source, they will feed on their molted exoskeletons or fecal matter. If you are unfamiliar with the GSL, you may want to look at [www.usgs.gov](http://www.usgs.gov) for some background information. Just search under "Great Salt Lake."

## Student Prior Knowledge

An understanding of the Great Salt Lake ecosystem and also interactions within ecosystems. They should be able to draw a food web of the GSL. Students should also know how to use a microscope and estimate microscopic lengths (to estimate the size of their shrimp and track growth). Students should also understand population survey techniques to estimate the size of their brine shrimp populations. Students should also understand the terms bias, biotic, and abiotic.

## Instructional Procedures

Obtain all needed supplies.

### 2. Hook

-When students enter the classroom pass around an unmarked jar of brine shrimp cysts. Let the students examine them. Ask if anyone knows what they are. Explain to the students that cysts are a strategy to save energy. In hostile conditions cysts form so energy is not wasted.

Introduce students to this lab through a review of the GSL and some of the environmental issues

surrounding the ecosystem. Some of these include the salinity changes in the N and S because of the railroad tracks, pollutions from boats/cars etc, rising temperatures, drought conditions, influxes of nitrogen and phosphorus from sewage and agriculture, loss of surrounding wetlands to urban development and how this affects water filtration etc.

Give them a copy of the student sheet

Go over the entire lab with them.

Allow them to choose groups of 3-4 students

Have students develop hypotheses, this may take some time

Let students design their lab and then get an approval signature from you

On Lab set up day you may want to go over how to create a percent solution ( $100 \times \text{percent} = \# \text{ g of salt}$ ). Those not investigating salinity should have around 5-6% salt solution.

Be sure to let your water sit overnight before using (unless using distilled water)

The shrimp should be placed under a heat lamp to ensure hatching

When students observe their shrimp, have them examine them under a microscope.

Encourage students to use all of their senses when making their observations.

Set up a microscope camera to the television and allow students to view the shrimp on the TV.

This is very high interest.

Allow students time to work on lab questions.

#### Assessment Plan

Use [rubric attached](#).

Answers: All answers will differ. You should grade based on completion, thoughtfulness and understanding.

#### Bibliography

Lesson Design by Jordan School District Teachers and Staff.

#### Authors

[Utah LessonPlans](#)