

## **Understanding the mysteries of the Great Salt Lake: Is there is something fishy going on?**

The smell hits you the moment you step in the door of Salt Creek, Inc. which is housed in a run down building in Salt Lake City's industrial section. Although the lake is land locked, the air smells like the ocean. An employee of Salt Creek, Inc. repairs a rubber pontoon while others clean two large, circular dryers. Canvas bags filled with what looks like wet sand are all around the floor of the building. There are coolers against the cement walls and shallow boats sit outside, ready for the upcoming harvest.

In the middle of the state of Utah, this scene seems out of place. It is a vision that would be expected on the coast of Maine or off the coast of Washington state. Owner Ben Perk's explanation is as odd as his business location. Those canvas bags aren't filled with wet sand, but with thousands of pounds of microscopic eggs. He makes his living from this harsh environment of Great Salt Lake and employs 56 men and women who rely on his company to support their families. These are the eggs of brine shrimp, he goes on to explain. Brine shrimp are half-inch long invertebrates that look like a cross between a scorpion and a cocktail shrimp. *Artemia* is their Latin name.

In the lab, Ben checks a petri dish filled with eggs under a microscope. They look like tiny dots and a teaspoon would hold about 250,000 eggs. However, they're big business for Ben and he harvests them by the billions and ships them to Asia, where aquaculture farmers hatch them out and feed the brine shrimp to prawns. The eggs ship easily because they stay in a state called diapause where they remain able to live as long as they remain dry. Once in contact with water of proper salinity, the eggs (cysts) rehydrate and enter a growth phase.

This year has been particularly productive. Ben isn't sure why but he has seen almost a 150% increase in productivity of eggs. He is pleased but wants to know why this has happened. There have been claims about changes in salinity of the Great Lake but he has also noticed that there has been some fluctuation in temperature as well. Ben knows that the more adults that hatch, the more eggs will be produced.

*Brainstorm Facts and Questions. Your job is to act as the scientific consultant to Salt Creek, Inc. Work in a team with your other classmates in order to test the cause of this increased productivity.*



## Facts





## Questions



## Brine Shrimp Inquiry

Brine shrimp can be difficult to work with in lab because they are so small and light. We will use a toothpick technique to pick up the brine shrimp and add them to the various test petri dishes. Following the pre determined laboratory, you will be determining what you want to test in this experiment based on the story, "*Understanding the mysteries of the Great Salt Lake: Is there is something fishy going on?*"

### Materials Available

Containers

Graduated Cylinder

Salt Solutions: 0%, 4%, 8%, 10%, 12%

Toothpicks

Metric Ruler

Incubator

Refrigerator

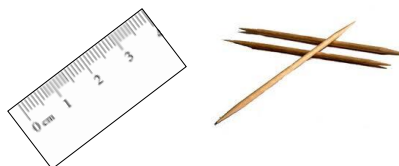
Aquarium Air Pump

### Procedure

1. Place 25 ml of 0% salt solution into one container and 25ml of 10% salt solution into a second container.



2. Measure and draw a line 5mm from the end of a toothpick.



3. Dip the toothpick into your vial of brine shrimp eggs.
4. Place the eggs into the container of 0% salt solution.
5. Repeat steps 3 and place the eggs into the 10% salt solution.



6. Count your eggs by using a magnifying glass. Record this number in the data table below.



7. Place a dark cloth over the containers.



8. After two days, count and record the number of brine shrimp that emerged in each container.

Data Table:

Solution	Number of eggs	Number of brine shrimp
0% Salt		
10% Salt		

Conclusion:

Write 2 questions that you asked about "*Understanding the mysteries of the Great Salt Lake: Is there is something fishy going on?*" that could be answered by doing an experiment?

Using some of the materials listed above, you will have the opportunity to develop your own investigation. Use scientific method design matrix below in order to plan your experiment.

Before you begin check the box below that represents your understanding of experimental design.

Vocabulary	Know	Heard Of	Don't Know	Definition
Hypothesis				
Control				
Independent Variable				
Dependent Variable				
Constants				
Data Collection				

## Experimental Design Matrix

**Title of the Experiment:** What are you trying to find out?  
Ex. The effect of   (independent variable)   on   (dependent variable)   in   organism  .

**Question Asked:**

**Hypothesis:** What do you think will happen during the experiment?  
If   (you do this)  , then   (this will happen)  .

**Control:** Part of the experiment used as a comparison. Normal conditions

**Independent Variable:** What are you testing or changing in your experiment? What are your units of measurement?

**Dependent Variable:** What results will you measure? What are your units of measurement?

**Constants:** List at least five things that it would be important to keep the same during your experiment so that it will be a fair test of your hypothesis.

Set up your experiment and record your procedure. Design a data table to record your data and write a summary of your findings.

Procedure:

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Data Table:

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Conclusion:

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