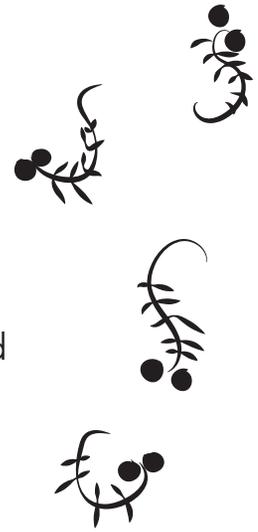


Brine shrimp have unique parts

A brine shrimp is an unusual aquatic animal that lays specialized eggs which can lay dormant like a seed. Similar to seeds, brine shrimp eggs only hatch when living conditions are just right for the young to survive. These eggs can sometimes lie dormant for many years in dry sand waiting for lake levels to rise and hydrate the eggs. Most animals in the world give birth to live young or lay eggs that contain developing young. Brine shrimp, however are not like most other animals. Their specialized egg structure allows them to grow in harsh environments that only occasionally receive water.



Brine shrimp have body parts and egg structures that help them survive harsh environments.

Brine shrimp live in salty water

Brine shrimp live in the Great Salt Lake which is extremely salty. The Great Salt Lake, is much saltier than the ocean. The water is so salty that fish cannot survive there. Brine shrimp are really tough and have some body parts and adaptations that help them survive in the super salty water.

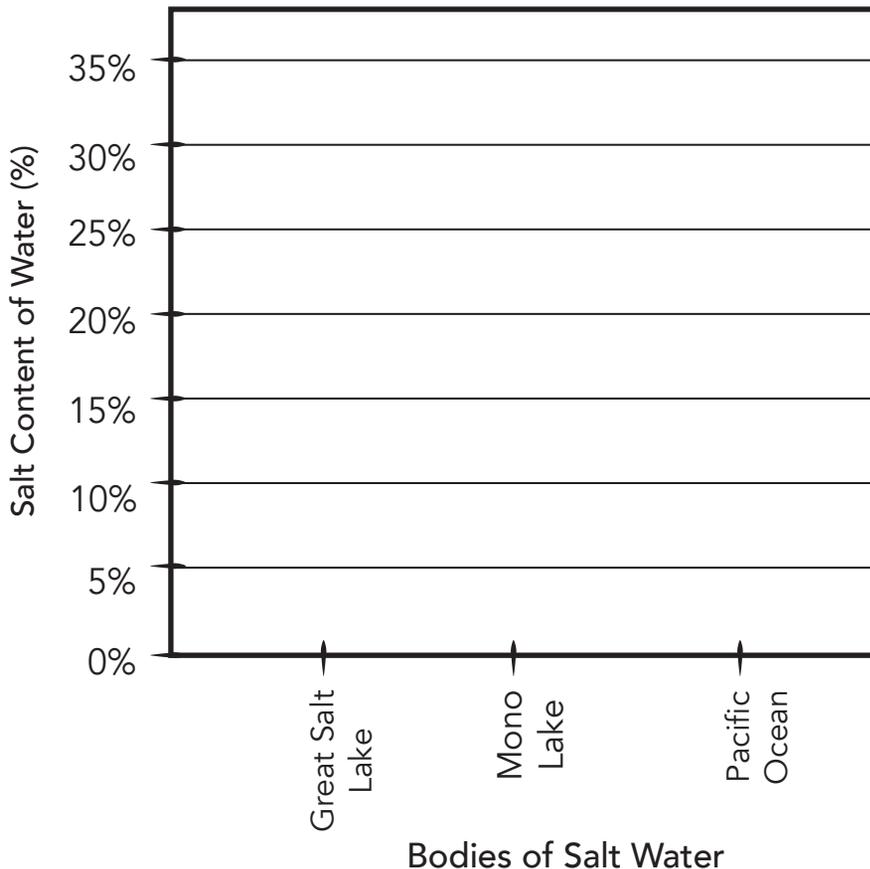
Saltiness Data

% Salt in the Water	Location
27%	The Great Salt Lake
9%	Mono Lake
4%	The Pacific Ocean

Graph the "Water Saltiness Data" in the graph below to see how salty the Great Salt Lake is compared to other bodies of water.

How Salty is the Great Salt Lake?

It is saltier than Mono Lake and the ocean!



You can hatch brine shrimp in your class

You can easily hatch and raise brine shrimp in your classroom. You will need to start by mixing salt water for your brine shrimp. Carefully measure and mix your saltwater. This will be your brine shrimp habitat.

Mix Your Saltwater Environment

What STEM tools you will need:

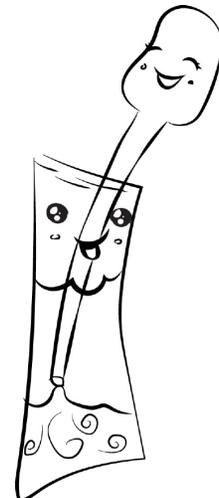
From Kea the crate, each student will need one Scoopy spoon, one Tedros test tube, and one Pippi pipette.



These students are getting a spoon, a test tube, and a pipette.

Step 1: Measure your water

Use Pippi pipette to fill Tedros test tube up to 40 ml.



These students are measuring their water.

Step 2: Measure your salt

Use Scoopy spoon to measure out one flat spoonful of salt. Add it to your water in Tedros test tube.

Step 2: Dissolve the salt into the water

Put the cap on your test tube and shake to dissolve the salt into the water. Add your saltwater to Mo the pitcher. This will be the saltwater environment that you will use to hatch your brine shrimp as a class.



Your shrimp are going to love that salt water.



These students are pouring the saltwater they mixed into a pitcher where they will raise their brine shrimp.



Large Batch Saltwater Mixing Instructions

Do you need to measure with teaspoons and cups?

For bigger batches of salt water, mix 1 teaspoon salt per cup of water.

Do you want to measure with Moe and Tedros in milliliters?

For a full pitcher of salt water, mix 1,500 ml water to 45 ml salt.



Brine Shrimp Activity 2: Observe Brine Shrimp Eggs

Brine shrimp eggs are tough

Brine shrimp eggs are among the toughest types of eggs in the world! They can lay dormant for up to 50 years in dry, hot sand. **Dormant** means that the eggs don't develop or grow, they just rest. It's as if they are frozen in time waiting for the right conditions to hatch.

The Great Salt Lake is large and parts of it are very shallow. Shallow areas frequently dry out. When the lake dries up, shrimp cannot survive. When the lake rises and the eggs soak up water, they hatch, and the life cycle of the brine shrimp begins again. Observe your brine shrimp eggs before you hatch them.



The tiny eggs look very interesting under Meeka microscope.



Brine shrimp eggs are so tiny they look like a powder to the unaided eye. Under the microscope you can see that many of the eggs become dimpled when they dry out.



Observe your brine shrimp eggs

The brine shrimp life cycle starts with a tiny egg. The egg of a brine shrimp is the first brine shrimp adaptation that I want you to observe and describe.

What STEM tools you will need:

Get one Scoopy spoon, one petri dish, and Meeka microscope.

Step 1: Get your brine shrimp eggs

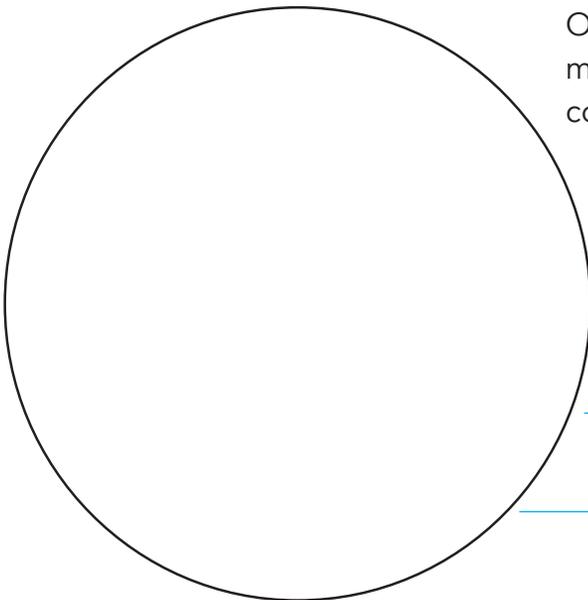
Touch the back of your spoon to the brine shrimp eggs. Don't scoop, just touch. You only want a tiny amount of eggs to stick on the back of the spoon. Then bring them back to your desk.



This student gets brine shrimp eggs on her spoon.

Step 2: Observe your eggs under the microscope

Observe your brine shrimp eggs under the microscope and describe them (size, shape, color, uniformity, what makes them unique).



Step 3: Put your eggs in the saltwater shrimp habitat

Wash the brine shrimp eggs off your spoon and petri dish in the salt water that you prepared earlier.



How to care for your shrimp

It should take about three days for your brine shrimp to hatch. When they finally hatch you will see tiny microscopic specks moving around in the water. Here are some tips for new brine shrimp owners:

How can I tell if they hatched?

First, make sure they are in a clear container that you can see through.

Hold the jar up to the light to look through it. In a room that is not well lit, you might not be able to see the hatchlings swimming around because they are microscopic.

If you still can't tell if they have hatched, suck up a sample of water with Pippi pipette and put it in a petri dish to view under the microscope. With a few squirts from different levels of water in the jar, you should be able to tell if there are critters swimming around in there.



What should I feed them?

Put a tiny Scoopy spoonful (a pinch) of spirulina powder in the water and another Scoopy spoonful (a pinch) of yeast in the water. Brine shrimp have special needs when they are newly hatched. Their mouths are too small for them to eat spirulina powder. Yeast cells are about the size of bacteria, and so the hatchlings can eat the yeast. When the shrimp grow a little larger they will eat the spirulina powder.



How often and how much should I feed them?

Don't put more than a pinch of yeast in the water. Too much yeast will kill them. Put a small Scoopy spoonful of spirulina powder in the water once every few days until the water is a little green. Then leave it alone for a while. If the water is a little green, they have plenty of food. Don't feed them every day or the water will become too dirty with uneaten food. Remember, they are filter feeders, so if the water is a little green, they have plenty of food.

Why are there so many dead shrimp in my water?

A tiny spoonful of brine shrimp eggs will hatch thousands of shrimp in your jar. The shrimp are very delicate. As a survival strategy, some species hatch thousands of young to guarantee that a few will survive. You may only have 5 out of 1000 of your shrimp survive to adulthood and that is okay.



Do I need to aerate the water?

Blow air into the water with a straw for 10 seconds a day to oxygenate the water.