6th Grade Strand 2: Salt Dissolved In Great Salt Lake

6.2
Digital Lesson Folder

The following teaching resources were curated by Megan Black in partnership with The Great Salt Lake Institute at Westminster College.
Recourse I: Salinity Changes in GSL

Analyze the data and then construct an explanation for how the salinity in GSL changes throughout the year. Be sure to use data from the graphs and reasoning based on your understanding of saltwater to write your explanation.
Resource II: Investigating Salt Water

Name: _______________________

Investigating Saltwater

Question: Where does salt go when you add it to water?

Task 1: Observations
1. Add one tablespoon of salt to a small cup of water.
2. Do not stir; observe what happens.
3. Now stir the salt and water. Observe what happens.

Where do you think the salt goes when you mix it with water?

Task 2: Measuring changes in mass
1. Place an empty beaker on the scale and push the tare button to zero the scale.
2. Measure 100 mL of water in the beaker.
3. Find the mass of the water and record it in the chart below.
4. Place a small piece of paper on the scale and push the tare button to zero the scale.
5. Measure about 15 grams of salt on the paper and record the mass in the chart below.
6. Place another empty beaker on the scale and push the tare button to zero the scale.
7. Pour the water and the salt into the new beaker. Stir to make saltwater.
8. Find the mass of the saltwater and record it in the chart below.

<table>
<thead>
<tr>
<th>Mass of water</th>
<th>Mass of salt</th>
<th>Mass of saltwater</th>
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What do you notice about the sum of the mass of water and the mass of salt compared to the mass of the saltwater?

What does this data tell us about where the salt goes when you add it to water?
**Task 3: Measuring changes in volume**

1. Measure 100 mL of water.
2. Measure 15 mL of salt using a tablespoon or graduated cylinder.
3. Mix the salt into the water and stir.
4. Measure the volume of the salt water.

<table>
<thead>
<tr>
<th>Volume of water</th>
<th>Volume of salt</th>
<th>Volume of saltwater</th>
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What do you notice about the volume of water and the volume of salt compared to the volume of the saltwater?

What does this data tell us about where the salt goes when you add it to water?

In your science notebook draw an initial model that shows where salt goes when it is dissolved in water.
What makes the Great Salt Lake in northern Utah salty? What makes freshwater lakes…well, fresh?

Freshwater does contain a little salt, eroded from rocks and soil. Even though salt constantly washes into freshwater lakes, it also flows out at the same time, eventually making its way into the ocean.

The Great Salt Lake is different from other inland lakes because it has no outlets to the ocean. Three rivers empty into the lake, but the only way water can exit the lake is by evaporation. When water evaporates out of the lake, it leaves most of its salt behind, just like in the ocean. In fact, the chemistry of the Great Salt Lake is similar to the ocean, except that it’s even saltier. That’s because the area is very dry and has a high rate of evaporation, which leaves behind a higher concentration of salt. The same concentration of salt happens in shallow, arid parts of the ocean, like the Red Sea and the Persian Gulf.

Why aren’t there any rivers flowing out of the Great Salt Lake? Let’s rewind about 30,000 years. A prehistoric, freshwater lake covered almost 20,000 square miles of Utah, Nevada and Idaho. Several rivers emptied into it and outlets flowed into the Pacific Ocean. As the glaciers receded from North America, the amount of water flowing into the lake decreased and the water level dropped, cutting the lake off from its outflowing rivers. The Great Salt Lake is a remnant of this prehistoric lake.

Source: https://indianapublicmedia.org/amomentofscience/the-great-salt-lake/
All Drains Do Not Lead to the Ocean

Much of the water that falls to the ground makes its way through a watershed - a series of streams, rivers and lakes - to the ocean. Water flows downhill, and the ocean is at the bottom of the hill, right? But Great Salt Lake sits at the bottom of a "closed basin". It's a terminal lake. The only way water can leave is through evaporation. So in this part of the world, all drains lead to Great Salt Lake. And what goes into the lake tends to stay in the lake.

Most terminal lakes have a high mineral content and, like Great Salt Lake, are quite salty. Even though the water flowing into Great Salt Lake is fresh, it contains small amounts of dissolved minerals. As water evaporates from the lake, the minerals stay behind. Over many thousands of years, minerals have accumulated to very high levels. The saltiest regions of Great Salt Lake are nearly 9 times saltier than the ocean.

Source: http://learn.genetics.utah.edu/content/gssl/physical_char/
Resource IV: Map of GSL and Utah Lake Watersheds

Map of Great Salt Lake and Utah Lake

Red arrows show water entering the lake (inflow).
Green arrows show water leaving the lake (outflow).

Source: http://learn.genetics.utah.edu/content/gsl/physical_char/
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